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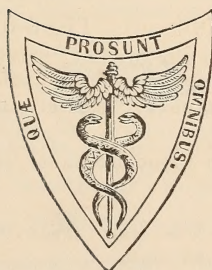
THE

AMERICAN JOURNAL

OF THE

MEDICAL SCIENCES.

EDITED BY

ISAAC HAYS, A.M., M.D.,

AND

I. MINIS HAYS, A.M., M.D.

NEW SERIES.

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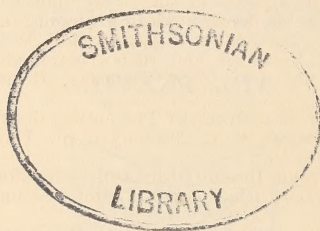
TO READERS AND CORRESPONDENTS.

ALL communications intended for insertion in the Original Department of this Journal are only received for consideration with the distinct understanding that they are sent for publication to this Journal alone, and that abstracts of them shall only appear elsewhere subsequently, and with due credit. Gentlemen favouring us with their communications are considered to be bound in honour to a strict observance of this understanding.

Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of February.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding *fifty*) will be furnished to authors, *provided the request for them be made at the time the communication is sent* to the Editors.

The following works have been received :—

Die Hautkrankheiten für Aertze und Studirende dargestellt. Von Dr. GUSTAV BEHREND, pract. Arzte in Berlin. Braunschweig : Friedrich Wreden, 1879.

Bidrag til Navlingssporgsmaalet. Af LEOPOLD MEYER.

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Lectures on Dermatology, delivered in the Royal College of Surgeons of England in 1876, 1877, 1878. Including Derangements of Colour of the Skin ; together with Affections of the Nails, Hair System, and Cutaneous Gland System. By ERASMUS WILSON, F.R.S., F.R.C.S. London : J. & A. Churchill, 1878.

On the Surgery of the Face. By FRANCIS MASON, F.R.C.S., Surgeon and Lecturer on Anatomy at St. Thomas's Hospital, etc. London : J. & A. Churchill, 1878.

The Bearings of Chronic Disease of the Heart upon Pregnancy, Parturition, and Childbed. With Papers on Puerperal Pleuro-Pneumonia and Eclampsia. By ANGUS MACDONALD, M.A., M.D. London : J. & A. Churchill, 1878.

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The Principles and Practice of Surgery.   By JOHN ASHHURST, Jr., M.D., Prof. of Clinical Surg. in Univ. of Penna., etc.   Second ed.   Enlarged and thoroughly revised. Philadelphia: Henry C. Lea, 1878.

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A Hand-Book of Nursing for Family and General Use.   Published under the direction of the Connecticut Training School for Nurses, State Hospital, New Haven, Con. Philadelphia: J. B. Lippincott & Co., 1878.

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On Rest and Pain.   By JOHN HILTON, F.R.S., F.R.C.S., Surgeon Extraordinary to Her Majesty the Queen, etc.   Edited by W. H. A. JACOBSON, F.R.C.S., Assist. Surg. to Guy's Hosp.   Second ed.   New York: William Wood & Co., 1879.

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Lectures on Localization in Diseases of the Brain.   By J. M. CHARCOT.   Edited by BOURNEVILLE.   Translated by EDWARD F. FOWLER, M.D.   New York: William Wood & Co., 1878.

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A Manual of Physical Diagnosis.   By FRANCIS DELAFIELD, M.D., and CHARLES F. STILLMAN, M.D.   New York: William Wood & Co., 1878.

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On the Use of the Solid Rubber Bandage in the Treatment of Eczema and Ulcers of the Leg.   By L. DUNCAN BULKLEY, M.D.   New York, 1878.

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Subsulphate of Iron as an Antiseptic in the Surgery of the Pelvis. By H. P. C. WILSON, M.D., Baltimore.

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Treatment of Fracture of the Shaft of the Femur. By FRANKLIN STAPLES, M.D., of Winona. St. Paul, 1878.

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Report on the Care of the Insane. By JOHN CURWEN, M.D. Philadelphia, 1878.

A Case of Acute Puerperal Inversion of the Uterus. By JOHN BYRNE, M.D. New York, 1878.

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The Development of the Nervous Tissues of the Human Embryo.

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The Proceedings of the Medical Society of the County of Kings.   October, November, December, 1878.

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Annual Address delivered before the American Academy of Medicine, by FRANK H. HAMILTON, M.D., of New York.

Annual Report of the Surgeon-General United States Army, 1878.

Report of the Health Officer of San Francisco.   San Francisco, 1878.

Report of the State Hospital for Women and Infants.   Philadelphia, 1878.

The following Journals have been received in exchange :—

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Archiv der Heilkunde.   Bd. XIX., Heft 5 u. 6.

Centralblatt für die Medicinischen Wissenschaften.   Nos. 37 to 48, 1878.

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Annales de Dermatologie et de Syphiligraphie.   Tome IX., No. 5.

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The usual British and American exchanges have been received; their individual acknowledgment is omitted for want of space.

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NO. CLIII. NEW SERIES.

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ARTICLE I.

THE HISTORY OF SIX CASES OF ABDOMINAL PREGNANCY.[1] By T. GAIL-LARD THOMAS, M. D., Professor of Obstetrics and Diseases of Women and Children in the College of Physicians and Surgeons, New York.

My experience in extra-uterine pregnancy extends to fifteen cases; of these seven were tubal, two interstitial, and six abdominal. All those of the last variety I propose now to relate, hoping at a future time to give an account of the instances of the first two forms which I have seen.

For the physiologist and pathologist many varieties of extra-uterine pregnancy exist which do not exist for the practitioner at the bedside. For him the ovarian, tubo-ovarian, tubo-abdominal, and other varieties are niceties beyond the appreciation of diagnosis, and he is forced to limit himself, as far as practice is concerned, to the classification of all varieties into, 1st tubal, 2d interstitial, and 3d abdominal pregnancies. These, by rational and physical signs, he may differentiate from each other, and in certain cases base the propriety of surgical interference upon his conclusion.

Although not attended by as great dangers as attach to tubal and interstitial pregnancies, the abdominal variety is a most serious aberration from normal gestation, and one which commonly destroys life.

In the first two forms the rapidly developing ovum is imprisoned in tissues which are inapt for great distention, and which rupture under its distending influence. In the third the fœtal ball has at its disposal for expansion and growth the whole peritoneal cavity, the placenta encroaching in its search after nutriment upon the bladder, the omentum, the intestines, and any portion of the peritoneum within its reach.

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[1] Read before the New York Academy of Medicine, Nov. 21, 1878.

The events of this form of pregnancy are the following: first, the fœtus unnaturally attached and nourished may die in the early months of its life, become encysted, and in time be cast off through the rectum, the bladder, or the abdominal walls. Second, the pregnancy may advance to the end of the ninth month, when labour coming on nature makes a persistent effort to expel the child, but on account of there being no way of exit, fails, and the child with its envelopes is retained, and, becoming encysted, remains in its nidus for years, creating no disturbance by its presence. Third, the child shut up in its unopened shell acts as a foreign body, creates suppurative action in its envelopes, and becomes surrounded with pus in place of liquor amnii; or, the liquor amnii being absorbed, the fœtal bones become closely hugged by the walls of the cavity which contains them, and, acting as an intense irritant which sets up formation of pus, in this way lead to hectic fever from absorption of septic material.

All these events are illustrated by cases which will be now related.

CASE I. *Abdominal Pregnancy; Death of Fœtus at an early period of gestation, and discharge through the rectum, with Recovery of Mother.*— I was called by the late Dr. W. T. Walker to see with him Mrs. R., a French lady, who, after suddenly occurring amenorrhœa of four months' duration, began to suffer from pelvic pain and severe backache. This prompted an examination, when a tumor was discovered posterior to the uterus, which was pushed forward and upward by it. No diagnosis had been made until a few days before I saw the patient, when the passage by the rectum of a very minute bone, apparently one of the metatarsal, made clear the nature of the difficulty, and announced the fact that the extra-uterine fœtus was dead.

The patient's sufferings had been so great as to have made her resort to the free use of the hypodermic injection of morphia, and this was affecting her system very prejudicially. All that was done during the time that I subsequently attended her with Dr. Walker was to persuade her to break off this habit, a most difficult task, to regulate the bowels, and to attend carefully to nutrition.

Very slowly and painfully after many months all the little fœtal bones were expelled by the rectum, and the patient entirely recovered. For three or four years, however, her health was greatly depreciated in consequence of the difficulty.

CASE II. *Abdominal Pregnancy; Death of Fœtus early in gestation; discharge through rectum, with Recovery of Mother.*—This case was almost identical with that just related, except that the diagnosis was made by art and not by nature.

Dr. Olcott, of Brooklyn, presented me to the patient, giving me no history of the case at all, and the patient being instructed to avoid all allusion to his opinion.

I found that all the symptoms of normal pregnancy existed, so that no suspicion of any aberration from it would have been entertained but for two symptoms; one, frequent and irregular attacks of metrostaxis, the other, severe pain in pelvis and back, extending down the thighs, and in some degree seeming to impede defecation.

Examining her with my mind free from bias, I made a pretty positive diagnosis of abdominal pregnancy, basing my opinion upon the fol-

lowing data : 1st. All the signs of normal pregnancy existed ; mammary, gastric, menstrual, etc.   2d. The uterus though enlarged was smaller than it should have been at that period of utero-gestation.   3d. The uterus was lifted up out of the pelvis, and pushed forward by a soft, elastic tumour which did not present the history or physical aspects of an imprisoned ovarian cyst or of hæmatocele.   4th. Emboldened by these signs to probe the uterus, it did not present the appearances of being occupied by the product of conception.

Had any doubt existed in my mind, I would have urged on Dr. Olcott the introduction of a sponge tent, but I felt satisfied, and found that he had himself arrived at the same conclusion.

As the locality of the tumour, its fixation in Douglas's pouch, and the fact that none of those peculiar rending and spasmodic pains which before the fourth month usually give premonition of and probably are instrumental in producing rupture in tubal pregnancy, existed, it was decided to keep the patient under close observation, and to wait.   In a short time afterwards fœtal bones were discharged by the rectum, the sac gradually emptied itself, and the patient entirely recovered.   I strongly suspect that the thorough examination made by Dr. Olcott and myself, produced the happy result of the death of the fœtus.

CASE III. *Abdominal Pregnancy; Laparotomy performed at the end of eleventh month of gestation, with Recovery of Mother.*—On the 13th of April, 1876, Dr. James Hadden, of New York, sent to me for examination Mrs. R., aged 26 years, a native of New York State, who had been married six years and had had one child, now five years old, and two abortions, one four years, and the other two years ago.

No peculiarities had developed in connection with the pregnancy or labour of five years ago, except that during the former she had menstruated regularly with the exception of one month, and that after the latter, she had suffered from an attack of puerperal fever, which had confined her to bed for six weeks.

Seven months before the date here given, she began to suffer from nausea and vomiting, and very soon after this time she had two or three attacks of intestinal trouble, which were marked by severe pain, retching, purging, and tympanites.   At her menstrual epochs metrorrhagia then developed itself.   Movement always tended to develop the unpleasant symptoms, or to increase them if they already existed.

About this period Mrs. R. declares that she distinctly felt the movements of a child in her abdomen, which was quite large, and came to the conclusion that she was pregnant.   As a number of obscure symptoms existed, she called on Dr. Hadden, who agreed with her in her opinion, and fixed the term of pregnancy at about three and a half months.

During February she had very distinct " bearing-down pains," and at that time it was thought that labour would come on in a few days.   She had also intense backache and pains in the side and abdomen.   Sometimes these were continuous, at others intermittent.   They were often so severe that morphia was administered for their relief.

Upon her visit to me, April 13, 1876, the patient was much emaciated ; her temperature $101\frac{1}{2}$ to 102 towards night ; the surface was dry during the day, but profuse perspirations occurred every night ; and the eyes presented that peculiar brightness so commonly noticed in hectic fever. At this time she was convinced that she had been in error as to her pregnancy, yet whenever she referred to the subject of the recognition of the

fœtal movements, she did so as one does who is convinced against her own convictions.

Upon examination I found that she presented an abdominal tumour as large as that created by the uterus at the full term of pregnancy. It yielded superficial fluctuation everywhere; no solid element appearing at any point, and everywhere over its surface percussion evidenced complete dulness. The linea alba was rendered dark by deposits of pigment, and the skin of the abdomen showed where great distention had created lineæ albicantiæ.

Upon vaginal examination the uterus was found anteverted, and I was much surprised to discover that it, as well as the other viscera of the pelvis, was fixed as if by an old attack of pelvic peritonitis. With some difficulty and a great deal of care, I passed a small uterine probe to the fundus, and found that the length of the uterine cavity was three inches and a half, perhaps a little more, but this was all that I attained to.

The patient, although, as I have stated, thoroughly convinced that she was not pregnant, and fully persuaded that she had an ovarian tumour, seemed so clear in her declaration and description of fœtal movements in the earlier periods of her illness, that I examined the mammæ very carefully and discovered in darkened areolæ and hypertrophied glands evidences which decided me upon removing a large amount, if not all, of the fluid in the tumour before committing myself to a diagnosis.

Accordingly, upon the 22d of April, I removed by the aspirator of Dieulafoy four quarts of a sero-purulent fluid which contained albumen in large quantities, and resembled very closely fluid from an ovarian cyst, the walls of which have undergone inflammatory action. This, being submitted for examination to an excellent microscopist, was declared by him to present corpuscles which he believed to be ovarian.

I should have removed a larger amount of fluid, but when this had been withdrawn no more would flow. Believing that I had taken enough to enable me to make a complete chemical and microscopic examination, I withdrew the needle and found that the flow had been checked by obstruction of the canula by means of a pellet of white and dense lymph.

Palpation of the tumour now revealed the presence of a large solid mass within it, which was so movable that it could be rolled from side to side, and conjoined manipulation showed the uterine body fixed at the symphysis pubis, and somewhat larger than normal. I now made a positive diagnosis of abdominal pregnancy, and expressed the conviction, from which I never subsequently wavered, that the fœtus floated freely in a mass of sero-pus in the peritoneal cavity, that the pelvic roof was covered by a mass of consolidated lymph, and that the intestines, pressed toward the flanks, had been covered over and fixed there by the same material. This position I felt sustained in by the following facts: 1st, the existence of nausea and vomiting during the early months of the patient's illness, which disappeared, giving place to, 2d, distinct fœtal movements, about which the patient was so clear and confident that I could not divest my mind of a belief in their possible validity; 3d, the presence of a marked pigmentary deposit in the linea alba and the areola of the breasts; 4th, the presence of an enlarged though empty uterus, fixed, as were all the pelvic viscera, yet without evidences of pelvic peritonitis; and, 5th, the existence of a large solid body, which rolled around freely in the cavity of the abdomen. There may be those who will say that these evidences were too meagre for diagnosis. All that I have to say in reply is, that I thought otherwise, and had confidence in my belief.

The patient's family was informed of my conclusion, and gladly accepted the alternative of operation, as it was quite evident to them that death would be the inevitable result of further delay. The patient herself was left under the impression that ovariotomy was to be performed.

On the 10th of May I operated, at 3 P. M., at the residence of the patient, in the presence of Dr. Dusinberre, of Lock Haven, Penna., and Drs. Jas. B. Hunter, H. F. Walker, Charles S. Ward, S. B. Jones, and James Hadden, of New York.

The patient having been etherized, an incision was made extending from the symphysis pubis five inches upwards towards the umbilicus, and carried down to the peritoneum. Had I been operating without a firm belief in the diagnosis of abdominal pregnancy, and under an impression that an ovarian tumour existed, I should at this point have, I feel sure, been led into an error which would have lost my patient's life. The peritoneum was so much hypertrophied that I should have peeled it off from its apparently loose attachment to the abdominal walls, under the impression that it was an adherent ovarian cyst.

Cutting through it, a large amount of such fluid as I have described as removed by aspiration, flowed away, together with several ounces of white coagulated lymph, in shreds and masses. Now passing into the abdomen my right hand, I discovered the breech and legs of a large child presenting at the pelvis, and by the unoccupied hand placed outside of the abdomen, I could distinctly feel the head near the ensiform cartilage. Seizing the feet, I extracted the child, and removed all the fluid and lymph contained within the abdominal cavity.

From the navel of the child the umbilical cord ran and attached itself to the peritoneal surface at the left iliac fossa. It was severed near the peritoneum, and the child removed. I now lifted the abdominal walls and examined the empty cavity of the abdomen. Nowhere could any viscus be discovered, except at the pelvic brim where the uterus could be seen anteverted, and fixed by a copious deposit of lymph. The intestines pressed aside and backwards were everywhere similarly covered and bound down. A large empty cavity, extending from the diaphragm above, to the true pelvis, presented itself to the view of my associates and myself. The placenta could not be seen, although the attachment of the cord showed where it must necessarily have been.

In a case of tubal pregnancy, in which I removed the fœtus by cutting through the vagina about a year before this, I very nearly lost my patient from hemorrhage in consequence of an effort to deliver the placenta. This determined me to be very guarded as to any similar attempt here. Another fact which prompted such a conservative course was this: in removing the fœtus in Mrs. R.'s case, I had scratched the peritoneum, over the promontory of the sacrum, very slightly with my finger nail, and this wound bled so freely and persistently as to offer me a foretaste of what would have occurred had I endeavoured to remove the placenta. The decision of this point constituted, I feel, a crucial one in the operation. The delay, exposure of the peritoneal cavity, tax upon nervous system, and loss of blood attending removal would, I think, have decided the progress of the case adversely.

The placenta was left alone, a large glass drainage-tube placed in the lower extremity of the incision, and this was closed by silver sutures involving the hypertrophied peritoneum. The operation, which, including closure of the abdominal walls, was completed in twenty-two minutes,

being concluded, the patient was put to bed, quieted by opium hypoder-mically administered, and sustained by milk. The child was found to be a finely-developed girl, thickly covered with vernix caseosa, not decom-posed, measuring eighteen and a half inches in length, and weighing seven pounds. The cause of its death, which had evidently occurred some time before I was consulted, was quite evident. About its middle the funis was so tightly wrapped by a long hair, which was wound repeatedly round it, that its circulation was completely cut off.

After the operation, the temperature and pulse both subsided, the for-mer from 102° to 98.9°, and the latter from 120 to 107. A source of constitutional irritation and toxæmia had been removed, and its evil results upon the nervous system went with it. I shall not give a day-to-day record of progress, but merely mention two important facts, and then conclude. The patient was now placed by me under the charge of Dr. S. B. Jones, who reported her as doing surprisingly well until the fourteenth day. Until this time a spontaneous drainage of sero-pus oc-curred through the tube, the bowels acted daily, pulse and temperature were satisfactory, and it was thought that all danger was past. On the night of the 24th of May, however, she had a slight chill, which was fol-lowed by high febrile action. The temperature went up to 104°, and the pulse to 130, and septicæmia seemed imminent. I saw her about 2 o'clock in the night, with Dr. Jones, and passing my finger deeply down into the abdomen, dislodged a mass of very fetid blood, which was washed out by a stream of warm carbolized water projected through the drainage-tube, or rather through the opening which its presence had kept patent. These antiseptic injections were kept up by Dr. Jones every eight hours, until after forty-eight hours all evidence of danger had subsided.

Still, as the placenta was retained, the abdominal wound was at one point kept open by the glass drainage-tube. Time proved the propriety of this course. Five weeks after the operation, just as we had decided to venture upon complete closure, Dr. Jones was sent for in great haste, and found a small portion of fetid placenta protruding through the abdominal opening. This he seized, and by gentle rotation removed the whole. After this the patient rapidly recovered, very soon left her bed, and now presents an appearance of such perfect health that, upon a recent visit to my office, I did not recognize her.

One or two points in connection with this case are worthy of special note, and I draw attention to them, as they may prove of value to future operators :—

1st. I believe that, had a positive diagnosis not been made before opera-tion, the case would have ended fatally when the peritoneum was reached by the primary incision. Had it been supposed that an ovarian tumour presented itself, the peeling off of this from the abdominal walls, which would have been very easily accomplished, would likely have resulted in peritoneal sloughing and death.

2d. Had an effort at removal of the placenta been made, I think that, for reasons already assigned, disastrous consequences would have ensued.

3d. Had the abdominal wound been allowed to close by first intention, I think that the imprisonment of a putrid placenta would inevitably have created septic poisoning and its unfortunate train of consequences.

As I have omitted the daily record of pulse and temperature in this case, I will give it in the next, in order to show the gravity of such cases and the great advantage to be derived from antiseptic injections in the control of septic absorption in them.

CASE IV. *Abdominal Pregnancy; Laparotomy performed at the end of seventeenth month with Recovery of Mother.*—In November, 1877, I was consulted by Mary R., a negress, of Newark, N. J., who had been sent to me by her physician, Dr. Charles Young, of that city. She was 24 years of age, married, and had borne one child.

She gave the following history of her case: In June, 1876, the menses ceased and the abdomen began to enlarge, so that she supposed herself to be pregnant, and expected her confinement in March, 1877. At the usual time she felt the fœtal movements, which continued to be perceptible until March. At that time she had a few pains lasting for two days, and some hemorrhage, but these symptoms passed off and no others appeared. After that time the movements of the child ceased entirely. The menses appeared at the next period, and have continued regular ever since, but the abdomen has not decreased in size. Upon making a physical examination the uterine probe showed the uterus to be empty, $3\frac{1}{2}$ inches in depth. Right latero-version was found to exist, and in the abdominal cavity a large movable tumor not connected with the uterus could be distinctly felt. The diagnosis of abdominal pregnancy was made, and eight ounces of dark-red fluid were withdrawn by the aspirator. This, being examined chemically and microscopically, was pronounced by a competent microscopist to contain the ovarian corpuscle and be unquestionably the fluid of an ovarian cyst—precisely what had been reported of the fluid removed from Case III.

At the time of operation the patient measured in circumference thirty-four inches over the largest part of the tumor. The operation was performed on the 15th of November in the presence of a large number of medical gentlemen. An incision four inches in length was made, extending from the pubes upwards, was carried down through the peritoneum, but was found to pass directly over the placental attachment. The incision was therefore carried upward through the navel. A large amount of darkish-brown fluid escaped from the abdomen, and I then lifted out a well-developed, nine-pound girl. The cord was very short, and twisted so tightly upon itself as to have caused, I thought, the child's death.

The child was decomposed nowhere except about the vertex. The placenta, three times as large as it would have been in normal gestation, was attached to the bladder and anterior abdominal wall. The cord was cut short and the placenta left undisturbed, the abdominal wound being closed in such a manner as to leave an opening for its escape. Duration of operation twenty-four minutes.

The patient rallied well, and was free from nausea or other discomfort for some time. I now give the record of pulse, respiration, and temperature, as kept by Dr. Van Vorst, the House Surgeon of the Woman's Hospital, who devoted himself to the care of my patient with an assiduity and zeal for which I here render my acknowledgments.

" Patient was quieted by a hypodermic injection of ten drops of Magendie's solution of morphia, and was ordered to be kept entirely upon a milk diet. 6.30 P. M. ($3\frac{1}{2}$ hours after operation), P. 108, R. 20, T. 99°; axilla.

Nov. 16. 1.45 A. M., gtt. x Magendie, per orem. 8 A. M., P. 98, R. 24, T. 99°; ord. milk ℥j, lime water ℥ss, e. 1 h. 12 M., P. 106, R. 18,

T. $101\frac{3}{4}°$; slight bloody flow from uterus; slight pain; gtt. x Magendie, per orem. 5 P. M., P. 112, T. 102°. 6 P. M., P. 108, R. 24. 10 P. M., P. 112, T. 101°.

17th. Passed a comfortable night; milk ʒij e. 1 h. 8 A. M., P. 104, R. 21, T. $98\frac{1}{4}°$. 9.20 A. M., $100\frac{1}{2}°$. 12 M., P. 110, R. 22, T. $102\frac{1}{2}°$. 4 P. M., T. $101\frac{1}{2}°$. 6 P. M., P. 103, R. 21, T. $99\frac{3}{4}°$; ord. milk ʒiv e. 2 h. 8 P. M., P. 110, T. $101\frac{1}{2}°$.

18th. 8.30 A. M., P. 120, R. 16, T. $102\frac{1}{2}°$; quiniæ sulph. gr. x. 9.20 A. M., vomited. 12 M., P. 104, R. 22, T. $103\frac{1}{2}°$. 2 P. M., quin. sulph. gr. x; beef extract given alternately with milk. 6 P. M., P. 111, R. 24, T. $102\frac{3}{4}°$. 9 P. M., P. 124, T. 102°; no pain or tenderness about abdomen; facies good.

19th. 8.15 A. M., P. 133, R. 28, T. 103°. 9 A. M., quin. sulph. gr. x. 10.15 A. M., vomited. 12.20 P. M., P. 126, R. 26, T. $103\frac{3}{4}°$. 3 P. M., Dr. Thomas removed two stitches at lower portion of wound; a large quantity of fetid gas escaped; a catheter was inserted, and four ounces of very dark fetid fluid washed out; water strongly carbolized was then pumped in (by means of a Davidson's syringe) until it returned clear. 3.30 P. M. (immediately after the washing out was finished). T. $100\frac{1}{4}°$, per vaginam. 7 P. M., P. 132, R. 24, T. 103°. 8.30 P. M., washed out; afterward T. $103\frac{1}{2}°$, per orem. 10 P. M., T. $102\frac{2}{5}°$; washed out by Dr. Thomas; afterward T. $102\frac{1}{5}°$. 11.15 P. M., T. $100\frac{1}{2}°$. 11.30 P. M., gtt. x Magendie, per orem.

20th. 1.15 A. M., T. $100\frac{1}{4}°$. 4 A. M., P. 125, R. 20, T. 101°; washed out; fluid not very fetid; slightly bloody. 7 A. M., P. 125, R. 20, T. 101°. 8 A. M., P. 130, R. 24, T. $100\frac{3}{4}°$. 9.45 A. M., P. 130, T. $100\frac{1}{2}°$. 10.30 A. M., quin. sulph. gr. x, per rectum. 12 M., P. 123, R. 25, T. $99\frac{3}{4}°$. 3.30 P. M., P. 120, R. 23, T. 101°. 5 P. M., P. 140, T. $102\frac{1}{4}°$; washed out. 6.30 P. M., P. 128, R. 28, T. $99\frac{1}{2}°$. 9.30 P. M., P. 126, R. 26, T. $100\frac{1}{2}°$. 12 M., P. 122, R. 20, T. $100\frac{1}{2}°$; washed out.

21st. 5 A. M., T. 99°. 6.45 A. M., P. 120, R. 22, T. $101\frac{3}{4}°$; washed out. 8.10 A. M., P. 100(?), R. 24, T. 100°. 12 M., P. 116(?), R. 22, T. 101°; washed out. 3 P. M., P. 112(?), R. 26, T. $102\frac{1}{2}°$. 5 P. M., washed out. 6 P. M., P. 110(?), R. 23, T. $102\frac{1}{2}°$. 8 P. M., P. 130, T. $101\frac{3}{3}°$. 9 P. M., P. 124, R. 28, T. 103°; washed out.

22d. 2 A. M., P. 112, R. 24, T. $101\frac{1}{2}°$; washed out. 6 A. M., P. 112, R. 22, T. $101\frac{1}{2}°$; washed out. Since yesterday (*Nov.* 21st.) has had beef-steak three times a day, eggs, chicken broth, and ʒss spts. vini gallici t. i. d., milk *ad libitum*. 12 M., P. 123, R. 24, T. 103°; washed out. 2 P. M., P. 110, R. 26, T. 101°. 3.30 P. M., P. 114, R. 24, T. $101\frac{1}{2}°$. 4 P. M., washed out. 7 P. M., ord. enema by Dr. Thomas; three good stools. 9 P. M., P. 100°, R. 22, T. $100\frac{1}{2}°$. 12 M., P. 99, R. 26, T. 100°.

23d. 3.10 A. M., P. 97, R. 21, T. $99\frac{3}{4}°$. 6.40 A. M., P. 110, R. 32, T. $101\frac{1}{4}°$; washed out. 9 A. M., P. 99, R. 24, T. $98\frac{1}{2}°$. 12 M., P. 96, R. 26, T. $99\frac{3}{4}°$. 3 P. M., P. 96, R. 22, T. 100°. 6.30 P. M., washed out. 8 P. M., P. 108, T. $101\frac{1}{5}°$. 9 P. M., P. 104, R. 24, T. $99\frac{3}{4}°$.

24th. 2 A. M., T. 102°; washed out. 6 A. M., P. 110, R. 22, T. $101\frac{1}{4}°$; washed out. 9 A. M., P. 98, R. 20, T. $100\frac{1}{2}°$. 12 M., P. 110, R. 24, T. 102°; washed out. 3 P. M., P. 116, R 30, T. $101\frac{1}{2}°$; 4.20 P. M., washed out. 6.10 P. M., P. 110, R. 24, T. $100\frac{3}{4}°$. 9.15 P. M., P. 112, R. 26, T. $100\frac{1}{2}°$. 12 M., P. 106, R. 22, T. $101\frac{3}{4}°$; washed out.

25th. 7 A. M., P. 114, R. 22, T. 101°; washed out. 9 A. M., P. 110,

R. 24, T. 99$\frac{3}{4}$°.   12 M., P. 100, R. 24, T. 101$\frac{1}{2}$°; washed out.   3 P. M., P. 103, R. 24, T. 100°.   6 P. M., P. 100, R. 24, T. 101$\frac{1}{2}$°; washed out. 12 M., P. 104, R. 24, T. 100$\frac{3}{4}$°; washed out.

26th. 6.30 A. M., P. 100, R. 24, T. 100°.   9 A. M., P. 100, R. 24, T. 99$\frac{3}{4}$°.   12 M., P. 96, R. 24, T. 100$\frac{1}{2}$; washed out.   3 P. M., P. 120, R. 24, T. 99$\frac{3}{4}$°.   6 P. M., P. 118, R. 24, T. 101$\frac{1}{2}$°; washed out.   9 P. M., P. 100, R. 26, T. 100$\frac{1}{2}$°.   12 M., P. 109, R. 20, T. 101$\frac{1}{2}$°; washed out.

27th. 3.30 A. M., P. 103, R. 22, T. 99$\frac{3}{4}$°.   6.49 A. M., P. 99, R. 19, T. 99$\frac{1}{2}$°; washed out.   9 A. M., P. 104, R. 24, T. 99$\frac{3}{4}$°.   12 M., P. 112, R. 24, T. 100$\frac{1}{2}$°; washed out.   3 P. M., P. 109, R. 24, T. 100°.   6.30 P. M., P. 107, R. 24, T. 100$\frac{3}{4}$°; washed out.   9 P. M., P. 99, R. 24, T. 100$\frac{1}{2}$°.   12 M., T. 101°

28th. 6 A. M., P. 92, R. 28, T. 100°; washed out.   9 A. M., P. 100, R. 24, T. 99$\frac{3}{4}$°.   11.30 A. M., washed out; moved into chair.   12 M., P. 109, R. 22, T. 100$\frac{3}{4}$°.   3 P. M., P. 98, R. 22, T. 101°.   6 P. M., P. 96, T. 100$\frac{1}{2}$°; washed out; cavity appears much smaller, as judged by the quick return of the injected fluid.   12 M., P. 99, R. 22, T. 100°.

29th. 6.10 A.M., P. 96, R. 20, T. 99°; washed out.   10.45 A. M., washed out; sat up in chair.   12 M., P. 120, R. 24, T. 101°.   3 P. M., P. 108, R. 21, T. 101°.   3.30 P. M., washed out; a chunk of the placenta the size of a walnut was removed, very much decomposed and fetid.   6.30 P. M., P. 122, R. 24, T. 102°; washed out.   9 P. M., P. 106, R. 26, T. 101$\frac{1}{2}$°.

30th. 12.20 A. M., P. 94, R. 20, T. 101$\frac{1}{2}$°; washed out.   3.35 A. M., P. 99, R. 24, T. 100°.   6.45 A. M., P. 104, R. 22. T. 99$\frac{3}{4}$°; washed out.   12 M., P. 112, R. 24, T. 100$\frac{1}{2}$°; washed out.   3.30 P. M., P. 102, R. 20, T. 100°.   6.45 P. M , P. 112, R. 24, T. 101°; washed out. 12 M., P. 100, R. 22, T. 99$\frac{1}{4}$°; washed out.

Dec. 1st. 6 A. M., P. 99, R. 22, T. 99$\frac{1}{4}$°; washed out.   12 M., P. 116, R. 24, T. 101$\frac{3}{4}$; washed out; patient has not been feeling so well for last two days; appetite not so good.   3 P. M., complains of pain in bowels; ordered hot poultice.   4 P. M., two diarrhœa stools.   6 P. M., P. 114, R. 24, T. 101$\frac{3}{4}$°; washed out.   8 P. M., one diarrhœal stool.   9 P. M., P. 124, R. 28, T. 101$\frac{3}{4}$°.

2d. 12.10 A. M., P. 114, R. 24, T. 102°; washed out.   6.30 A. M., P. 112, R. 22, T. 101$\frac{3}{4}$°; washed out; all food stopped but milk ; brandy ʒj t. i. d. as before.   12 M., P. 125, R. 24, T. 102°; washed out; a piece of placenta walnut size was removed; the amount of discharge is small but very fetid.   3 P. M., P. 120, R. 24, T. 103$\frac{3}{4}$°.   6.30 P. M., P. 118, R. 24, T. 101$\frac{1}{2}$°; washed out.   9 P. M., P. 112, R. 22, T. 102°.   12 M., P. 118, R. 24, T. 103$\frac{3}{4}$°; washed out.

3d. 3.20 A. M., P. 120, R. 24, T. 101$\frac{1}{2}$°.   6.30 A. M., P. 110, R. 22, T. 100°; washed out.   11.30 A. M., P. 104, R. 26, T. 98$\frac{1}{4}$° : washed out. 6 P. M., P. 114, R. 24, T. 100$\frac{1}{2}$°; washed out.   9 P. M., P. 110, R. 24, T. 100$\frac{3}{4}$°.   12 M., P. 110, R. 24, T. 101°; washed out.

4th. 6.45 A. M., P. 108, R. 22, T. 99$\frac{1}{2}$°; washed out.   12 M., P. 105, R. 25, T. 99$\frac{1}{2}$°; washed out ; patient resumed ordinary diet.   6 P. M., P. 116, R. 24, T. 101$\frac{3}{4}$°; washed out.   12 M., P. 104, R. 20, T. 100°; washed out.

5th. 7 A. M., P. 106, R. 20, T. 99$\frac{3}{4}$°; washed out.   12 M., P. 104, R. 20, T. 100°; washed out.   6 P. M., P. 100, R. 20, T. 100$\frac{1}{2}$°; washed out.   12 M., P. 100, R. 20, T. 99$\frac{3}{4}$°; washed out.

6th. 6 A. M., P. 104, R. 22, T. 99$\frac{3}{4}$°; washed out.   12 M., P. 99, R.

20, T. 100°; washed out.   6.30 P. M., P. 99, R. 20, T. 100½°; washed out.   12 M., P. 96, R. 22, T. 99½°; washed out.

7th. 7.30 A. M., P. 102, R. 24, T. 99¾°; washed out.   12.30 P. M., P. 88, R. 20, T. 100°; washed out; a small portion of the placenta removed; walked across room with assistance; sat up in chair entire afternoon.   6.35 P. M., P. 118, R. 24, T. 100°; washed out; patient is not to be washed out at 12 M. any more, because morning temperature for last three days has been below 99° (corrected temperature) and discharge hardly fetid although puriform.

8th. 7 A. M., P. 100, R. 20, T. 100°; washed out.   12 M., P. 108, R. 22, T. 99¾°; washed out; sitting up in chair; walks about without assistance.   6.30 P. M., P. 110°, R. 24, T. 100¼°; washed out.

9th. 7.30 A. M., P. 100, R. 20, T. 100°; washed out.   12 M., P. 100, R. 20, T. 100°; washed out.   7 P. M., P. 100, R. 19, T. 99°; washed out.

10th. 9 A. M., P. 89, R. 18, T. 99½°; washed out.   12 M., P. 100, R. 24, T. 99¾°; washed out.   8 P. M., P. 99, R. 21, T. 100°; washed out.

11th. 8 A. M., P. 92, R. 20, T. 99°; washed out.

Patient to have cavity washed out only morning and evening.   The index finger was introduced into the cavity and the remaining portion of the placenta felt very hard and dense.   The return fluid is not fetid, and only very slightly puriform.   The opening is closing rapidly, so that there is just room sufficient for the water to escape alongside of the catheter (No. 10).   Put on house diet.

18th. Patient goes about the ward and assists the nurse.   Washed out morning and evening.

25th. Patient to go home, being capable of washing out the cavity herself daily.   Placenta still remains attached to abdominal walls.   Patient to see her physician occasionally."

This is rather a lengthy and tedious detail of the progress of this case, and yet I offer no apology for its introduction.   It appears to me that its value as an illustration of the great importance of antiseptic injections in such cases, and as a demonstration of what can be accomplished by faithful attention, removes the necessity of so doing.

Case V. *Abdominal Pregnancy of twenty-two months' standing; Fœtus delivered by Laparotomy, with Recovery of Mother.*—As this case has been fully reported by Dr. E. Frank Coates, of Mystic Bridge, Ct., in whose practice it occurred, I extract his report from the *Proceedings of the Connecticut Med. Society*, for 1878, and give it entire :—

" I was first called to Mrs. J. W. M., aged 21 years and 6 months, an American by birth, and above medium size, April 30th, 1875.   I found her pregnant for the first time, with general anasarca, indisposed to exercise much, and feared puerperal eclampsia.   With appropriate treatment she went to full term, and May 21st I delivered her with the forceps, under chloroform, of a still-born child, after a labour of about twenty-four hours' duration.   It was living a short time before its birth.   Septicæmia followed.   She had pelvic abscess, abscess in the thigh, and did not get well over the effects of the blood-poisoning for more than three months.   After dismissing my patient in September, I was not called to her again until February, 1877, when her husband informed me that she was again pregnant, expecting to be confined about April 20th to 25th, and though she felt well, and very different from her former gestation, he wished me to call in some

time when I was passing, and it was convenient. I found her apparently well; functions normal; countenance good, cheerful, and doing the work for four in the family, and happy in it.

April 4. I was called, and found she had pains that came on the latter part of the previous night, resembling labour pains; made a hurried examination, pronounced the pains spurious, and gave an opiate, which soon quieted her, but she was exhausted beyond what is a common consequence of such pains, and was able to lie only on the right side. The evening of the 5th she vomited large quantities of bilious matter; the next day a bilious diarrhœa set in, which was checked with opium. I then gave a large dose of calomel, followed by castor oil. After this she vomited once every morning for some time, but the diarrhœa was easily controlled.

The discharges were of a clayey colour, for which I gave several blue pills, without any visible benefit. The urine, during all of this time, was normal in quality and quantity. She could lie only on the right side, except for twenty minutes at a time; she would sometimes be turned upon the left, but could not lie on the back. She was restless, requiring a small opiate once every night, and sometimes oftener, to keep her comfortable.

She did not have any more uterine pains, and after waiting about three weeks —the time of her expected confinement—I made another digital examination, finding the uterus high up as before, the os not dilated, neck not shortened, the head not presenting at the brim of the pelvis. The whole fœtus was on the right side, and so high that no part could be felt with the examining fingers from within the vagina. I had no sound with me, and desisted from further investigation, but had learned enough to inform her husband and mother of my fears.

May 5. She commenced to have a show—shedding the uterine mucosa—which continued without pain from day to day for some time. Her husband, getting extremely anxious, requested his old family physician from Rhode Island to see her. The consultation was held May 21st, when I had the patient etherized, so that she could be laid on her back, and introduced the sound three inches within the womb, and could feel nothing but its walls. The uterus had a slight left lateral displacement, and was somewhat flexed to the right. The fœtus was dead, lying on the right of the median line, between the floating ribs and ileum, but the whole abdomen was distended. My counsellor had seen nothing of the kind; he evidently knew but little about it, but agreed with me in everything.

June 27. The show continues, and to-day she had a fall upon her knees, which caused some metrorrhagia, which was soon followed by a dirty, sanious, watery discharge. Afterward she was so constipated that the whole rectum became impacted with fæces, so as to require large injections of soap and water, often repeated, and their removal caused great pain. I see the patient once a week. She is weak, emaciated, and the show continues—which, it will be remembered, commenced May 5th—with occasional passages of a dirty brown, sanious water, and, it is thought, there is more of this discharge when she lies on the left side, which she cannot do except only for a short time; but her countenance has improved. She looks brighter, is more cheerful, can eat somewhat better, but milk is her chief support. She sleeps well, but requires opium in some form to keep her easy.

July 18. There has not been so much show or watery discharge for the last week. The abdomen is greatly distended, and has been for several weeks. This night a watery, dirty discharge commenced anew, with vomiting, and pain in the back, somewhat severe. The night of the 19th she saturated everything that was laid under her, even to the mattress, and the discharge continues more or less profuse for six days without loss of the patient's strength.

The 25*th* I find the abdominal enlargement very much lessened, and can feel the outlines of the fœtus. Is this the liquor amnii? and is it discharged through the right Fallopian tube?

The 30*th* I am called, and find loss of appetite, with occasional severe spasmodic pains in the back, but not much sanious discharge for the last two days.

31*st*. Patient is more comfortable; has had no severe pains since last seen. The watery discharge commenced again last night; this forenoon it has been quite abundant, and for the first time somewhat offensive.

August 1. I met Dr. C. M. Carleton in consultation, who agrees with me in the course pursued, and also that, unless the condition of the patient could be improved, gastrotomy would result in death.

6th. Has had very little show for about three weeks, no severe pain since last seen ; the same discharge continues. She is getting smaller, her appetite is better but not good, and she has sat up three hours in a day. The 10th she is not as well ; appetite very poor, but no severe pain. The night of the 14th had severe pain in the stomach which lasted until morning, and greatly prostrated her ; the same discharge continues.

22d. No pain, not as much discharge and this has changed ; a membranous, meaty discharge is mingled with it.

29th. Quite comfortable ; better appetite ; some pain, but not severe ; discharge muddy-looking but not so membranous.

September 5. The shreddy, muddy discharge continues, general health improved.

12th. The discharge continues muddy and pulpy, and yesterday it was judged that a teacupful of settlings was discharged, and a finger-nail was found on the cloth she wore. She is in good spirits and thinks she will get well. From the 19th to October 8th she is quite comfortable and seems to improve in appetite and countenance. There is less of the meaty discharge. She has sat up two hours and more at a time, and walked into the kitchen.

October 16. She has not been as well for several days ; there is more discharge and thicker, like decayed chopped meat. Countenance has a hectic flush, pulse frequent and irregular ; bowels in good condition and have been for a long time ; smell of discharge at times quite offensive.

22d. Not much change, but she has discharged two semi-putrid meaty pieces larger than butternuts.

29th. Discharge about the same in quantity but less meaty and less offensive. She was 24 years old yesterday.

November 7. More pain, appetite fair, bowels loose but not a diarrhœa. She has discharged two bones of a finger.

23d. Sleeps well, appetite poor, pulse weak, not much pain, hectic flush on cheek. Has discharged what appear to be pieces of tendon, and one phalangeal and one metacarpal bone, not so much other discharge.

30th. About the same, pulse very feeble, and more discharge, which is sometimes tinged with blood.

December 7. She is more restless at nights, has neuralgic pains in different parts of the body, and is getting smaller.

13th. Appetite improved ; sleeps better ; bowels regular ; hectic flush nearly gone ; discharge continues.

February 28. Continues to improve ; rode out yesterday without hurting her ; has the discharge when she lies down, but not while sitting ; it is somewhat bloody to-day. There is considerable thickening of the subcutaneous cellular tissue in the lower right hypogastrium where the fœtus was at the first most prominent. She does all her walking in a stooping posture, assisted by a cane or some support, as from the first.

March 21. The discharge continues while lying, but is not tinged with blood. It has been of a greenish colour, and more offensive within a few days. Occasionally there is some discharge from the centre of the umbilicus, and has been for the last two months ; it has increased of late and appears in look and smell like that from the vagina. It probably comes from the sac that surrounds the fœtal bones. She appears as well as when last seen three weeks ago, but has not improved. She is very sore, and cannot bear pressure over the sac, especially on the left side. She has improved in flesh. When at the greatest emaciation a garter of $6\frac{1}{2}$ inches was worn below the knee to hold the stocking; now $9\frac{1}{2}$ inches is required for the same purpose. I have advised gastrotomy as soon as she can willingly consent to it. Her general health is good.

April 14. I have been preparing the patient, trying to get her full and free consent to an operation, and finally succeeded. Believing that she will have better care at the New York State Woman's Hospital than her circumstances will

allow at home, I have made arrangements to have her taken to that institution; and Dr. T. Gaillard Thomas is engaged to operate.

30th. Arrived at the hospital at 9½ o'clock, A.M. Considerably fatigued, but in good spirits, and has borne the journey very well. At 3½ P.M. met Dr. Fordyce Barker and Dr. Thomas in counsel, who agreed with me that gastrotomy should be performed as soon as the patient could be rested and the bowels cleared, so as to get ready for it.

May 3. The patient is placed on the table and etherized. At 3 o'clock the abdominal cavity was opened; and a sac adherent to the walls and in front of the intestines found, which contained but little else except the bones; and as these were turned out Dr. Thomas said to me, 'I find everything as you predicted.' The sac was entire, but in removing the bones, which had become separated and imbedded in its walls, it was torn so as to allow some of its filthy contents to escape into the peritoneal cavity, thus greatly endangering peritonitis and septicæmia. The posterior portion of the sac was then slit open, so as to allow free drainage. The cavity was sponged, a drainage-tube inserted, and the external wound closed around the tube by silver-wire sutures. She was then placed in bed, a hypodermic injection of morphia given, and soon recovered from the ether, and shock of the operation; but all who witnessed it believed her chances for complete recovery were very small. The next day I received a telegram from the House Surgeon, saying, she is 'doing first-rate.'

5th. Dr. Barker informs me that the patient appears 'quite bright and cheerful. Her temperature was only 99°; pulse 110. No tympanites, no peritonitis; and it is rather late to expect a development of septicæmia, and if severe renal complication does not exist, she has a pretty fair chance of recovery.

'*6th.* The temperature has not risen to 100°, but the pulse has averaged 130–136. She has vomited a good deal of a dark-green fluid for the last two days. The abdomen is slightly tender, and it is thought she has peritonitis. The abdominal cavity is washed out daily through the glass drainage-tube.'

10th. She is doing well; has much less vomiting; pulse and temperature both lower, pulse 120, temperature 98½°.

11th. 'Dr. Thomas regards her as out of danger.'

15th. The House Surgeon informs me that 'the drainage-tube has been taken out and the discharge is very slight, although fetid. The average temperature is 99½°. She does not vomit. Her general appearance is excellent. She has overturned all our theories, and done better than we had any idea of.' "

This case entirely recovered, and the patient left the hospital perfectly restored to health. I can recall no instance in which I have performed any capital operation upon a patient so depreciated in constitutional condition. The operation was undertaken as a "forlorn hope," and with a decided conviction on my part that it would fail to save life. It was one of those unfortunate instances in which one operates merely from a strict sense of duty. Although the case ended favourably I feel that out of nearly one hundred and fifty laparotomy operations which have fallen to my lot it was less skilfully and cautiously performed than any other. The patient recovered without the development of a bad symptom, but she recovered in spite of certain untoward occurrences which I could have and should have avoided. Instead of rapidly evacuating the extra-uterine sac of its contents, and in the removal of bones firmly attached to the cyst wall tearing through so as to open a communication with the peritoneal cavity, I should have slowly and cautiously removed the mass of bones, and then, leaving the abdominal wound open for the gradual discharge of others which were attached, kept up antiseptic injections until the fœtal shell had entirely contracted and extruded its contents through the wound.

Case VI. *Abdominal Pregnancy now advanced to four months and one week: Still in Progress and kept under observation.*—This case I am now attending with Dr. Wilhelm Frankl, and I will give the history in his words, as he has very kindly written it out and put it at my disposal.

" Mrs. T., aged 30 years, born in Austria, married since 3d February, 1869, was delivered 14th October, 1869, of her first and only child, a healthy girl, now nine years old, without professional assistance. Her menstruation was always regular, lasting three days, not very profuse, until 1875, when she was taken ill with metrorrhagic and abdominal pains, and confined to bed from the end of November to the middle of March, 1876. Since this time she was again well and regular, until 29th of this July, when she had only a show of blood for one day. In the middle of August she lost some blood, felt a little uncomfortable, had vomiting at different times, and her breasts were swollen, so that she believed herself to be pregnant. In the beginning of September she was taken ill with pain in the bowels, and with metrorrhagia, the blood containing at the end of September well formed membranes. After several weeks treatment by a quack with hot water injections, I was called in on the 17th of October.

" I found the patient in bed, very weak, suffering from abdominal pains extending to the back and limbs, pale through loss of blood ; pulse feeble, over 100, temperature 101° in rectum. The cervix uteri was behind the symphysis ossium pubis, corpus uteri, slightly enlarged, easily felt through the abdominal walls above the os pubis. Passing my fingers into the vagina, I felt in the back wall more to the left, a swelling, increasing towards the fornix vaginæ, behind the cervix forming a tumour, round, not tender, but dense. This tumour could be felt by bimanual manipulation in the right iliac region. On macroscopical and microscopical examination, I found the expelled membranes to be ' deciduæ.'

" These facts, with the given symptoms of common pregnancy, and the statement of the patient that she feels the rolling of something in her abdomen when she moves from one side to the other, induced me to exclude all other possibilities and to make the diagnosis extra-uterine, and especially abdominal, pregnancy."

It will be seen that before I saw this case Dr. Frankl had made the diagnosis. Upon a very careful examination, I was led to agree with him by the following rational and physical signs : first, the existence of all the ordinary signs of pregnancy with irregular sanguineous discharge ; second, the existence of a painful tumour behind the uterus ; third, the expulsion of decidual membranes without abortion ; and fourth, the displacement upwards and forwards of the uterus by a tumour which, by exclusion, could be proved not to be a hæmatocele, an ovarian cyst, or a fibroid.

It is quite true that the diagnosis may not prove to be correct ; but a diagnosis being merely a logical deduction from given premises, I believe this to be the most logical which can be maintained under the circumstances.

The diagnosis, prognosis, and proposed plan of treatment were, by Dr. Frankl and myself, clearly laid before the lady's husband, and he cheerfully accepted the alternative of waiting, in the hope that, at a later period,

when nature has pointed out the channel which she would prefer for extrusion of the fœtal mass, operative interference would be far safer than at present. The hope was likewise held out to him that at the end of the ninth month of extra-uterine gestation the crowning triumph of obstetric surgery might be gained by saving the lives of both mother and child, as was done in the case recently reported by Mr. Jesop, of Leeds, to the London Obstetrical Society. At the same time, the fact was made quite clear to him that delay might result in the sudden rupture of the fœtal sac and the immediate death of his wife. The dangers of delay were balanced against those of immediate operation, and he readily consented of two extreme dangers to choose the lesser.

I have operated six times for extra-uterine pregnancy, but never have I done so without good reason for believing that delay would be far more dangerous than immediate interference. Out of the six operations, four have saved lives which were in imminent peril. My experience makes me willing to accept as a rule the precept that operative procedure in extra-uterine pregnancy had better, if possible, be delayed until nature points to the channel of extrusion which she selects. The most dangerous of men, however, are those who implicitly, unthinkingly, obey rules. The bold and wise surgeon is he who keeps the rule for general guidance, breaking it unhesitatingly when an exceptional indication demands such a course. I must confess, too, that I regard the basis upon which rest the rules of practice with reference to this whole subject as unreliable and requiring complete and careful reconsideration. The usual starting-point for the discussion is Campbell's monograph, a contribution which, although excellent for its day, is now almost as completely obsolete a guide for practice as the dicta of Blundell and Ramsbotham would be upon ovariotomy. I have given in my adherence to the orthodox creed in these cases, but if this poor lady be not cut untimely off by rupture of the fœtal shell, I shall watch with eager eyes for some valid indication to make an exception to an unfortunate rule by which her life, and perhaps that of her offspring, may be snatched from an impending fate.

There is in this interesting case one feature from which I take great encouragement, and which I have not yet specially mentioned. The post-uterine tumour evidently tends to burrow downwards, forcing the fluid which it contains into a pouch between the vagina and rectum, below the uterus, by pushing downwards the pouch of Douglas. This tendency makes me hopeful that in case interference becomes imperative before full term it may be practised with diminished risk at this point ; while, should the full term arrive and the head of the child, pushing aside the uterus, present here, I may be able to cut through the vaginal wall, seize the head by the obstetric forceps, and deliver a living child from a woman only slightly endangered by the operation almost *per vias naturales*.

In the year 1816, Dr. John King, a country practitioner, residing upon

Edisto Island, on the Coast of South Carolina, met with just such a case as I have described, and being both a bold and original man, one who recognized the importance of exceptions to rules, he followed the course to which I have alluded with the result of saving mother and child. This case will be found published in the *Med. Repository,* 1817, and a pamphlet upon the subject by Dr. King is now in possession of Dr. Pooley, of Yonkers, N. Y.

In my last case the great danger is that an error of diagnosis may have been made as to the variety of extra-uterine pregnancy which exists, and that this error may be suddenly announced by rupture of the sac and fatal collapse on the part of the patient. But even if such an error was now known to exist, I would not, under present circumstances, feel warranted in accepting the grave dangers of immediate operation. In such a case, he who strives to act conscientiously for the true interests of his patient, must be guided merely by the best light which is afforded him at the moment when decision is called for. In this case I feel that the course which is being pursued is that which is dictated by sound judgment.

Were these cases published simply as " six cases of extra-uterine pregnancy," the report would be calculated greatly to mislead in reference to the mortality of this terrible aberration of gestation. Here are six reports of unquestionable and carefully observed instances of this condition with not one death ! Surely it might from this be said extra-uterine pregnancy, managed by the means at the disposal of modern surgery, is to a great extent bereft of its old-time dangers ! But these cases are not so published, and although I have already endeavoured to avoid the creation by them of any erroneous impression, I still further effect that object by stating the mortality of the remaining nine cases of extra-uterine gestation with which I have met.

Of two cases of interstitial pregnancy one died, and one recovered after a dangerous interference which saved her life. Of seven tubal pregnancies six died, and that which survived did so only after submitting to a capital operation in itself sufficient to have destroyed life, but which in this case fortunately saved it.

It will thus be seen that the results here published bear me out in the statement made in the commencement of this paper that abdominal pregnancy, although attended by great dangers, is far less hazardous than any of the other varieties of this class.

The question now arises as to the time at which surgical interference should be practised in such cases. In the other varieties of extra-uterine pregnancy, the continued progress of gestation exposes the woman to constant and steadily increasing danger of sudden death. In the abdominal form it not only does not do this, but it is often the wise course to allow the process to continue until the child arrives at full development, as has been done in repeated cases, and as I am now doing in Case VI.

But let us suppose that either before or after full term of gestation the child has died, and it is pretty certain that the woman carries her dead offspring within the peritoneal cavity.   Is it wise on this account at once to interfere by surgical means?   I think not.   One of the greatest dangers attaching to interference consists in hemorrhage.   The longer time that the placenta remains attached after fœtal death the more certain it is to become atrophied, and consequently less vascular.   Another great danger consists in septicæmia.   The more thoroughly the fœtal envelopes become disgorged and atrophic from loss of function, the less likely is this dangerous complication to develop.   Judicious delay and cautious waiting for symptoms indicative of approaching trouble are then, in my opinion, decidedly advisable.

But such delay, such waiting, are by no means to be carried as far as in Cases V. and III., where the symptoms of septic absorption had gone in one case to marked constitutional depreciation, and in the other to production of a condition which almost precluded the posibility of recovery. Non-interference carried as far as this is not less to be deprecated than a rashness which results in intemperate and premature resort to operation.

No fixed rule can apply to all these cases.   The following may guide the practitioner in general, he modifying them to suit the varying indications which may present themselves :—

1st. Before full term, should the child developing in the peritoneal cavity be alive, its growth may be carefully watched, and the end of the ninth month be waited for in the hope of delivering at that time either by laparotomy or elytrotomy a living child from a living woman.

2d. Should the child have died early in pregnancy, delay in interference is advisable, but this should not be carried to the production of septicæmia or hectic.

3d. Should the full term be passed, and the child be still imprisoned in its unnatural resting-place, the rule should be to wait for evidences of constitutional disorder on the one hand, and to meet its development promptly and decisively by succour on the other.

Article II.

On the Elastic Bandage in the Treatment of Aneurism, with a Case of Femoral Aneurism, Cured by this Means. By Robert F. Weir, M.D., Surgeon to the New York and Roosevelt Hospitals.

It is only within a comparatively recent period that the idea of rapidly coagulating the blood contained in an aneurism has been carried into effect. This was done, as is well known, by Murray in 1864, who attracted attention to the method by his remarkable success in curing an abdominal aneurism by four hours' consecutive pressure on the aorta above the tumour.

Successful Cases.

No.	Surgeon.	Aneurism.	Duration of elastic compression.	Method of bandaging resorted to.	Subsequent compression.	Effect of compression on limb.	Result.	Remarks.	Where reported.
1	Reid, Plymouth.	Popliteal, traumatic.	50 minutes.	Up to, lightly over and above aneurism; after tubing put on bandage taken off.	Carte's compressor kept on with intermittent pressure until ev'ing of next day.	Temp'y numbness of the toes, and some lancinating pain on ext. part. of leg.	Cured.	The pulsation had stopped when the tubing was taken off. No pulsation in artery below point where tubing was applied. (No anæsthetic.)	Lanc. Sept. 23, 1873, for post-mortem appearances see Lanc. Aug. 5, '76.
2	Wagstaffe, London.	Popliteal, traumatic.	55 minutes.	Up to, lightly over and above; tubing not used.	Complete compression continued by tourniquet for 6 h. 35 sec.	Leg slightly swollen.	Cured.	Pulsation stopped in two hours. (No anæsthetic.)	(No Lanc.Sept.30,'76, for p.-mort.ap. see M. T. & G. Nov.10, 77.
3	Heath, Manchester.	Popliteal, idiopathic.	60 minutes.	Up to, lightly over and above aneurism; tubing not stated; erect position used.	One hour complete and four hours incomplete compression resorted to.	Toes blue and cold.	Cured.	Pulsation stopped at end of 60 minutes. (No anæsthetic.)	Lancet, Nov. 4, 1876.
4	Wright, London.	Femoral in Hunter's canal, traumatic.	2¼ hours.	Up to, lightly over and above aneurism; erect position not used; tubing employed.	Shot-bag kept on for 13¾ hours.	Whole limb, when bandage was removed, was dusky and cold.	Cured.	Pulsation had nearly ceased when tubing was remov'd, but did not stop until 13¾ h. after. Recurred a little same eve. Shot-bag was then kept on for 4 days, when all pulsat'n had gone. (No anæsthetic.)	Lancet, Feb. 3, 1877.
5	T. Smith, London.	Popliteal, idiopathic.	60 minutes.	Up to, not over and above aneurism; tubing used.	Complete by tourniquet for two hours.	Not stated.	Cured.	The tumour was found solid when the tourniquet was removed. (No anæsthetic.)	Lancet, May 26, 1877.
6	Tyrrell, Dublin.	Popliteal, idiopathic.	50 minutes.	Up to, lightly over and above aneurism; tubing used.	Digital compression resorted to for 2 h. afterwards, and as a precaution a moderately tight tourniquet for some hours after that.	Numbness of the toes and foot, which disappeared in 24 hours.	Cured.	Slight pulsation was detected when Esmarch's bandage was removed. (No anæsthetic.)	Lancet, June 30, 1877.
7	Croft, London.	Popliteal, idiopathic.	60 minutes.	Up to, not over and above aneur.; tubing used, also erect position.	Digital compression for six hours.	Ecchymosis about knee for ten days.	Cured.	Pulsation felt in tumour when bandage taken off; stopped in six hours. (No anæsthetic.)	Lancet, Jan. 19, 1878.
8	Cornish.	Anterior, tibial, traumatic.	60 minutes.	Up to and above aneurism; put in erect position; tubing used.	Tourniquet, with complete compression for 2 hours and 10 min.	Ordinary symptoms	Cured.	Pulsation had ceased when the Esmarch bandage was removed. (No anæsthetic used.)	Lancet, Feb. 16, 1878.
9	Mansfield, Liverpool.	Popliteal, idiopathic.	2 trials, 45 min. each two days apart.	Up to, lightly over and above aneurism; tubing used.	After 1st trial tourniq't lightly applied for 4h.; after 2d trial flexion resorted to; tumour became firmer; flexion continued to 8th day.	No mention made.	Cured.	The first trial produced a solid feeling in the aneurism, and the benefit was thought to be more due to the first trial than to the second one. (Anæsthetic used.)	Lancet, Jan. 19, 1878.
10	Syd. Jones, London.	Popliteal, idiopathic.	2 trials, 1st, 65 minutes, 2d on 4th day for 40 minutes.	Up to, not over and above aneurism; tubing not employed.	Instrument'l and digital press. after 1st trial, respectively 2 h. 15 m. and 4 h. 15 m. After 2d trial digital compression for 4 h. 51 m.	No mention made of condition of limb.	Cured.	Pulsation felt as soon as Esmarch bandage was removed. After compression 6½ h. pulsation ceased to recur 2 days later, though aneurism was much harder. Tumour harder and puls-eless; after 2d trial no recurrence; in 2d trial bandage carried higher in groin. (No anæsth.)	Brit. Med. Journ., Oct. 20, 1877.
11	O. Bloch, Copenhagen.	Popliteal, idiopathic.	60 minutes.	Up to, lightly over and above aneurism; tubing used.	Carte's compressor for 1 hour, then digital compression for 5¾ h.	Toes cold and blue, but rapidly recov'd when bandage was removed. Some paralysis of foot for a few days.	Cured.	When bandage taken off tumour hard but not pulseless. Pulsation disappeared under the digital pressure.	Ho-pit Tidende,[1] 2 R. iv., 54 & 51.

[1] Kindly translated from the Danish for me by Dr. Geo. R. Cutter, of New York.

Failures.

No.	Surgeon.	Aneurism.	Duration of application of elastic compressor.	Method of bandaging resorted to.	Subsequent compression.	Effect of the compression on the limb.	Result	Remarks.	Reference.
1	Bradley, Manchester.	Popliteal, idiopathic.	2 trials; 1st, 50 min.; 2d, 1 w'k later, 65 min.	Up to and above aneurism, which was left exposed.	None.	.....	Failure	Pulsation recurred almost immediately after bandage was removed. Ligature afterwards resorted to.	Br. Med. Journ., Oct. 26, 1876.
2	T. Smith, London.	Popliteal, idiopathic, and femoral, traumatic on sane side.	50 minutes.	Aneurism nearly emptied by pressure of bandage carried up to over and above.	None.	.....	Failure	Was not sure that circulation was completely arrested by bandage as sac was covered over. Femoral artery was ligated *below* upper aneurism. (No anæsthetic.)	Lancet, May 26, 1877; Dec. 1, 1877.
3	Fleming, Netley Hosp.	Femoral (high up), traumatic.	2 trials, 1 hour and 50 minutes respectively.	Bandage applied "in manner recommended," Reid's compressor applied to external iliac.	None.	.....	Failure	Though tumour felt harder and pulsation appeared less, yet there was no permanent good result, and external iliac was ligated. (Anæsthetic.)	Br. Med. Journ., Oct. 1, 1877.
4	C. Heath, London.	Popliteal, idiopathic.	4½ hours.	Up to, not over and above aneurism; placed erect; tubing used.	None.	.....	Failure	Carte's compressor for 102¾ hrs., and flexion for 65 hrs., had previously been used. After failure with Esmarch's bandage ligature was used, pulsation recurred after 19 hours, then ceased for 14 days, and on recurring again the femoral was ligated a second time with a hempen ligature, the first having been of catgut. The aneurism was supposed to be a tubular one. (Anæsthetic.)	Lancet, Dec. 1, 1877.
5	Campbell, Liverpool,	Popliteal, idiopathic.	3 trials of 50 min. each, at intervals of some days.	Up to, slightly over and above aneurism; tubing used.	"A tourniquet was kept on some time afterwards."	.....	Failure	Femoral ligated. Galvano-puncture under Esmarch suggested but not practised.	Lancet, Jan. 19, 1878.
6	Barwell, London.	Popliteal, idiopathic.	2 trials: 1st of 70 minutes; 2d, for 5 hours.	Esmarch's elastic bandage applied from toes up the thigh, compressing strongly the aneurism.	None.	.....	Failure	Fusiform aneurism in a patient very much run down by albuminuria, hæmoptysis and syphilis. From history it seems that the tumour returned immediately after the withdrawal of the bandage, and was unaltered in character. (Anæsthetic not stated.)	Lancet, Jan 26, 1876.
7	Page, London.	Popliteal, idiopathic.	3 trial; 1st, 90 minutes; 2d & 3d, 1 hour each.	Up to and above but not over aneurism; tubing used; sac filled by hanging leg downwards.	Tourniquet placed on limb to control but not to arrest the circulation, and kept on till next day; this was repeated each time.	Œdematous which lasted two days, and ecchymosis about heel and knee after 3d trial.	Failure	By the bandage a considerable hardening of the aneurism was produced each time except the last, tumor then increased in size with more violent pulsation. Femoral ligated. (Anæsthetic.)	Lancet, March 23, 1878.
8	Lane, London.	Popliteal, traumatic.	60 minutes.	"Applied in the usual manner."	Digital comp. 1 hour and a "tourniquet" applied.	.....	Failure	Pulsation less when Esmarch's bandage removed, but returned in full force that evening. (Anæsthetic.)	Lancet, May 11, 1878.
9	Markoe, New York.	Popliteal, idiopathic.	2 hours.	Up to, over and above aneurism.	None.	.....	Failure	Pulsation returned on removal of the elastic bandage. Femoral ligated.	Unpub. Records Roosevelt Hospital.

His example was speedily followed by Mapother, of Dublin, who success-
fully treated an ilio-femoral aneurism by totally arresting the blood-current
by pressure, continued for four and a half hours, which was not only
applied above the tumor to the common iliac, but also, as suggested by
O'Ferrall, below it, upon the femoral artery, in order to keep the sac full of
blood. Other cases have from time to time been reported in the journals, but
considerable difficulty has, until a short time since, been experienced in the
means resorted to in bringing about the occlusion of the artery between the
aneurism and the heart. Mechanical contrivances worked, as a rule, un-
satisfactorily, and digital compression, though more effectual, was not
always easy to command. The accomplishment of the end desired was
really one of the indirect benefits derived from the bloodless method, pre-
sented to the profession by the distinguished Esmarch, and was effected
by Staff Surgeon Walter Reid, who in 1875 published (*Lancet*, Sept.
25) an account of a case of popliteal aneurism which had been cured
by him in fifty minutes by the application of Esmarch's elastic band-
age. This success was also obtained in a number of instances by various
surgeons who had read or heard of this rapid method of curing so serious
an affection. Up to the present time I have been able to find recorded
some twenty cases of aneurism wherein this method has been tried, a
summary of which is to be seen in the accompanying tables (pp. 34 and 35.)

To this list I beg to add the following case, which has lately occurred
under my own observation :—

Traumatic Femoral Aneurism Cured by ninety-three minutes' Compres-
sion by the Elastic Bandage (Reid's Method).—Capt. O. H., of the U. S.
A., aged 45, was admitted into the New York Hospital August 26, 1878,
with the following history : In March of the present year, while exercising
with his company (cavalry) at Fort Bayard, N. T., his horse stumbled
and so nearly threw him that his left foot was disengaged from the stirrup,
and his right thigh severely jammed against the pommel of the saddle. A
few days later, attracted by the continued pain in the limb, the post sur-
geon discovered, at the apex of Scarpa's triangle, the presence of an an-
eurism the size of a hen's egg. Twelve days afterwards, March 24, digi-
tal compression at the groin was resorted to by relays of soldiers, which
was continued to April 6, the pressure being made at first one hour and
twenty minutes per diem, and gradually increased to six hours a day, but
no good result ensued. On the 10th, 11th, and 12th of April Esmarch's
elastic bandage, without the tubing, was applied up to, over, and above the
tumour for one hour each day, without any anæsthetic being employed,
and, although the tumour hardened somewhat under this treatment, the
patient, who was naturally a very nervous man, became so excitable that
all treatment of the aneurism was abandoned until the 10th and 11th of
May, when the elastic bandage was again applied in a similar manner,
for forty minutes each time, without, as before, any subsequent compres-
sion of the artery being made after the elastic bandage was removed.
Digital compression was then resumed for six hours daily, from May 13
to July 12, supplemented the greater portion of the time by the use of
instrumental pressure (Briddon's artery compressor), for one hour each

day.   During all these trials the patient steadily refused the use of an anæs-
thetic, and it is only just to Dr. R. E. Smith, U. S. A., the post surgeon,
to quote from his statement that, "had I been privileged to use ether,
there were times in the treatment when I thought by this means I would
have cured the tumour."   When the patient left to come to New York
the aneurism was decidedly harder, but during the journey it rapidly in-
creased in size, and, when he entered the hospital, it measured some six
inches both vertically and transversely, and the limb in circumference two
inches more than its fellow.   The tumour began six inches from Poupart's
ligament, and was easily compressed, its wall was thin and it pulsated
strongly with a harsh loud bruit, heard most distinctly at its proximal
end.   The general condition of the patient was of considerable nervous
depression and anxiety, but examination revealed no organic lesion of the
kidney, heart, or lungs, and the sphygmograph showed equality in both
radials.

On reviewing the history it was felt that owing mainly to the fears of
the patient, the method of elastic compression had not been fully tested in
his case, and on this being explained to him, he consented to another trial
with the aid of ether.   On August 29th the attempt was made by first
covering the limb smoothly with a flannel bandage from the toes to the
groin, leaving the aneurism, however, exposed; then, at 3.50 P. M., an
elastic bandage was firmly applied from the toes up to just below the
tumour.   The patient was then stood up in order to have the aneurismal
sac fully distended, and while in the erect position a second elastic band-
age was applied from just above the tumour to the groin, and secured by
three turns of half-inch india-rubber tubing, at a point just below the
origin of the profunda femoris.   The recumbent position was then re-
sumed.   It was observed, in corroboration of his statement relative to the
previous trials, that the elastic bandage alone, though tightly drawn, did
not entirely control the pulsation in the aneurism.   This only ceased when
the tubing was applied.   The patient bore the compression very well for
the first half hour, but, finding by that time that the aching pain, felt
mostly at the site of the tubing, was becoming unbearable, ether was ad-
ministered.   During the first ten minutes also sphygmographic tracings
of the radials were made for purposes of comparison with those taken im-
mediately prior to the putting on of the bandage.   These showed a perceptible
increase in the arterial tension.   At the end of one hour and thirty-three
minutes (5.23 P. M.) a Signoroni's tourniquet was applied to the common
femoral just below the groin, having a soft damp sponge interposed between
the pad and the skin, and the tubing and elastic bandage were taken off.
A momentary test by unscrewing the tourniquet showed the aneurism to be
pulseless, but knowing the ease with which a recent clot is washed out of
a sac, and experience having proved the innocuousness of prolonged com-
pression, it was determined to keep up the pressure for six or eight hours
longer.   This was pursued until 8.50 P. M., when the breathing had be-
come so shallow and such signs of œdema of the lungs presented themselves
that it was deemed advisable to suspend the ether.   This was done, and
the tourniquet also removed, when the tumour was found to be hard and
without pulsation.   The beating of the femoral artery could be traced
below the point where the tourniquet had been applied down to the line of
compression of the rubber tubing, but below it could not be felt.

During the application of the tourniquet it was carefully watched by
an assistant, who kept his fingers on the artery below in order to detect

and arrest any pulsation, should any slipping of the instrument occur. This happened twice, but by such means the arrest of the blood-current by the elastic bandage and by the tourniquet was held complete for a period of five hours and ten minutes without any damage occurring to the limb. A bag of shot weighing seven pounds was then placed over the artery just below Poupart's ligament, and fastened on by broad strips of adhesive plaster, and the limb enveloped in cotton batting loosely secured by a bandage. The thoracic symptoms disappeared in the course of two hours. The shot bag was removed the next day at noon; at that time it was noticed that pulsation in the artery could be felt down to the tumour, and that running inwards from the upper margin of the sac was a small pulsating vessel, which, within the next twenty-four hours, rapidly enlarged. On the third day the patient left his bed, and soon thereafter began to walk about. His general condition also rapidly improved, and by the time he left the hospital, September 24, he had gained greatly in flesh; by that time the tumour was not more than one-third its original size.

It will be noticed that out of the twenty-one collated cases, all but four were aneurisms of the popliteal artery, the exceptions were two affecting the femoral, one the ilio-femoral, and one the anterior tibial artery. Also, of these twenty-one cases, there were twelve cases successfully treated, in two of which, however, a second resort to the bandage was required. In the nine cases wherein failure occurred, fourteen trials of the method were made, but, as pointing most strongly towards the reason for the want of success, in nine out of the fourteen trials made, no subsequent compression of the artery above the aneurism was resorted to. In one of the failures where the bandage was used three times, it is reported that the tourniquet subsequently used was lightly applied until the next day, so as to control but not arrest the pulsation in the tumour. In another case, where three trials were also made, it is indefinitely mentioned that the tourniquet was kept on for "some time afterwards," and in Fleming's case, where Esmarch's bandage was applied twice for an hour and forty minutes respectively, no subsequent use of the tourniquet was resorted to. Per contra, in every case where success followed, the flow of blood through the aneurism was completely prevented by a tourniquet, digital compression, or otherwise, for a period of time varying from two to nearly nine hours, except in one case, where the loosely applied tourniquet failing to arrest the lessened pulsation in the aneurism, moderate flexion of the limb for several days was required to bring about a cure.

In this continued obstruction of the arterial current after the withdrawal of the elastic bandage and tubing consists the gist of the treatment. I had thought, in first looking up this subject, that failure might be due to the fact that sometimes the elastic bandage was carried over the tumour as well as up to and above it, and that thereby the aneurism was unduly compressed; and that it was sometimes neglected to stand the patient upright before the bandage was applied above the tumour; yet success crowned such apparently imperfect methods.

But there remain certain other cases where, as in Heath's, the com-

pression seems to have been ample, and all the technique of the treatment carefully carried out, yet failure resulted.   The case reported by Heath is, however, so peculiar, that the explanation of atheroma offered by Petit (De la Compression Élastique dans le Traitement des Anévrysms.   L. H. Petit.   *Bull. Gén. de Thérap.*, June and July, 1878) for the non-success of the rapid method in the cure of aneurism hardly applies.   In respect to this point made by Petit, it may be stated that a number of successes were noted in patients with marked atheromatous degeneration, that is to say, in the 12 successful cases there were 7 idiopathic and 5 traumatic aneurisms, and in the 9 failures there were 7 idiopathic and 2 traumatic aneurisms.

Before passing to the consideration of such suggestions as have been developed by the examination of this series of cases, it will be well to look for a moment on the reports made respectively by Messrs. Reid and Wagstaffe on the pathological appearances presented some time afterwards in aneurisms thus treated.   Reid (*Lancet*, Aug. 5, 1876) had the opportunity of examining the case cured by him some nine months afterwards, and found the artery occluded for $2\frac{1}{2}$ inches of its course by fibrous tissue, and that the centre and also that portion of the cavity adjacent to the vessel were occupied by an amorphous, non-laminated, coffee-coloured substance of the consistence of cheese, which showed no sign of organization or of vascular connection with the surrounding parts.   The portion of the aneurism opposite to its mouth was occupied by several layers of laminated fibrin.

Wagstaffe (*Med. Times and Gaz.*, Nov. 10, 1877) exhibited at the Pathological Society the aneurism that he had treated by the elastic bandage five months prior to the patient's death.   The popliteal aneurism was cut across and showed a clot, firm externally, but soft internally, though not laminated.   Microscopical examination of the aneurism, Mr. W. reports, had shown that the greater part of the thrombus was organized ; the central portion was soft, and contained no vessels.   The patient died from rupture of a small aneurism at the root of the aorta, which filled the pericardium with blood.   In connection with this condition, *i. e.*, an internal aneurism, it is but wise to call attention again to the caution previously given (*N. Y. Medical Record*, Feb. 2, 1874), as to the effect of increasing the arterial tension by the use of the elastic bandage.   In the case now reported in this paper the sphygmographic tracings, it will be remembered, showed, ten minutes after the application of the bandage, a decided increase in the tension at the radial pulse.

In Wagstaffe's case no mention is made by him of the condition of the artery ; but, in a communication to the *Lancet*, Nov. 10, 1877, by Mr. Gould, attention is called to the fact that, as in Reid's case, the artery for a distance of some two or three inches was occluded with organized fibrous tissue.   Mr. Gould hence attributes the cure of an aneurism by this method

to the occlusion of the artery by the extension of the clot into it from the aneurism, and considers a fairly healthy state of the vessel wall essential for the proper organization of the thrombus. He also thinks that aneurisms with large mouths are therefore easier cured by Esmarch's bandage. In the case which has just been given it was noticed, when the tubing was removed from the limb, that the pulsation of the artery could be traced distinctly to the line of redness produced by the rubber tubing, but not below it. The next day, however, after all compression had ceased, pulsation could be felt in the femoral down to the sac itself, and running to the inside of the latter was an arterial branch, which, in the course of forty-eight hours, markedly increased in size. The explanation offered was that the clot in the vessel had been washed out through the collateral branch. The mouth of the sac was also from the sharpness of the bruit, deemed to have been of small size.

If, as has been supposed, the certainty of success is dependent on the time allowed for the formation of a passive clot in the aneurism, and possibly in the artery leading to it, the important point to be determined is the length of time that is necessary to safely accomplish this. The term safely, it must be understood, applies more particularly to the integrity of the limb. In fact, but little is yet afforded us to determine how long the total arrest of circulation in a limb can be borne. A number of cases are, however, to be found in the medical journals which bear upon the question, such as Wheelhouse's (*Brit. Med. Journal*, Dec. 27, 1873) successful case of complete compression of the abdominal aorta for five consecutive hours for aneurism of the external iliac; also Mapother's case of popliteal aneurism where instrumental compression (complete) was made on the femoral nine and one-half hours (*Brit. Med. Journal*, Oct. 5, 1867); and also more strongly pertinent, the lately reported one of Dr. Erskine Mason (*N. Y. Medical Journal*, Sept. 1877), with whom I was associated in conducting the compression of the common femoral for a varicose aneurism for a period of eighteen hours under ether, during which time the arrest of the arterial current was absolute. In these cases no damage whatever came to the limb. A yet more interesting case is one hitherto unpublished, and kindly furnished me by Dr. B. K. Hoxie, of Auburn, N. Y., where for a femoral aneurism he applied a screw tourniquet to the common femoral immediately below Poupart's ligament, and kept up absolute compression for thirty-three hours and forty minutes without any impairment of the vitality of the limb, save a slight numbness and little œdema. The aneurism was solidified; but ten days afterwards symptoms of suppuration of the sac occurred, and the aneurism was freely opened, discharging some sixteen ounces of grumous blood, dark, and "almost like gunpowder." The case thereafter progressed well. A slight slough ensued at the site of the pressure. While in this case suppuration of the sac occurred, this accident is more reasonably to be charged to

the pressure and to the contiguousness of the slough to the aneurism rather than to the effect of a passive clot, as no sac complication has yet been observed in any of the successfully treated aneurisms by elastic compression.

In respect to the prolonged use of Esmarch's elastic bandage, the experiments of Cohnheim and Jeremoff have shown that, on the lower animals, it can be borne with impunity from six to eight hours; and in the human subject, as experience widened, especially in the treatment of aneurism, the duration of the enforced ischæmia has been increased from fifty minutes at first to four and one-half hours by C. Heath, and to five hours by Barwell, innocuously. These cases afford us so far the severest test of the elastic bandage, with one remarkable exception, which is extracted from the *Wiener Mediz. Wochenschr.*, June 21, 1878. In this case, for the arrest of a repeatedly recurring hemorrhage from an incised wound of the thenar eminence in a boy of 14 years, and after sundry trials of other methods, the hand, forearm, and a portion of the upper arm were enveloped by an elastic bandage, which, together with the encircling tube, were kept applied for *fourteen consecutive hours.* The hemorrhage was arrested and did not recur, but, as soon as the bandage and tubing were removed, rapid swelling with intense redness came on, sharply defined at the constriction produced by the tubing. This in an hour took on the appearance of an acute diffused inflammation, and was associated with a motor paralysis in the hand of a severe degree. Under the use of cold compresses the redness and swelling quickly disappeared in from three to five days, but the paralysis remained for two or three weeks. The nerve-lesion is of little interest, as it has already been recognized as one liable to occur from the pressure of the tubing on thinly protected nerve-trunks, but the absence of the sphacelation that one might have reasonably expected in such an exsanguined patient and the comparatively little reaction that followed the use of the bandage were most satisfactory in the solution of the scientific question.

Surgeons can, therefore, I think, hereafter be justified in continuing elastic compression for a period of time probably much beyond what has yet been attempted. Before endeavouring to arrive at exactness in reference to this period, an appreciation of a variation of the mode of treatment should be had. Gersuny published lately, in Langenbeck's *Archiv für Chirurgie*, Bd. 21, p. 845, 1877, an account of a man in whom an aneurism had formed in each popliteal space. The left one was cured by prolonged intermittent pressure. The one on the right side, after failure with flexion, intermittent compression, mechanical and digital, etc., was unsuccessfully treated by the ligature, and eventually for it, Gersuny, having some fear of gangrene before him, cautiously proceeded to use the elastic bandage every second day for half an hour at a time; in the mean time snugly bandaging the limb and applying Signoroni's tourniquet for six or

eight hours daily. After ten days the elastic bandage was applied daily. By the seventeenth day the pulsations had nearly disappeared, but the treatment was further continued for some six weeks.

It is apparent that this was only a case of intermittent compression, more easily but not more rapidly carried out by means of Esmarch's bandage, for Murray (*Rapid Cure of Aneurism by Pressure*, 1871) states in reference to this that this old method, curing, as it does, by fibrinous lamination, lasted on an average five-and-twenty days.

Billroth (F. Raab, *Wien. Med. Wochenschr.*, Feb. 23 and March 2, 1878) reports a similar case. The application of the elastic bandage up to, lightly over, and above the aneurism, which was popliteal, was resorted to daily for twenty minutes at a time at the greatest, supplemented by the use of Signoroni's tourniquet for from one to four hours. The treatment thus instituted was brought to a successful issue at the end of six weeks.

The result obtained by Monmonier (*Maryland Med. Journal*, June, 1878) is more encouraging, and opens up a plan which is apparently one to be further developed. This case, a popliteal aneurism, was treated by the elastic bandage, purposely compressing the tumour so as to "press the sac close against the condyles of the femur," the obliteration of the aneurism being assisted by a thick compress placed under the bandage. This was retained around the limb for two hours at a time, and was resorted to four times, the control of the artery being secured in the meanwhile by a Skey's tourniquet.[1] Consolidation was found at the end of twenty-four hours to have taken place. The fact worthy of note is that complete arrest of the circulation was effected for twenty-four hours by the alternate use of the elastic ligature and the tourniquet.

This procedure has been more distinctly formulated by Dr. Ferguson (*Lancet*, Sept. 28, 1878), of the Cheltenham Hospital, England, under the title of " Repeated Proximal Applications of an Elastic Compressor in the Treatment of Aneurism." By this method a popliteal aneurism was successfully treated as follows : The india-rubber tubing, without any use of the elastic bandage, and with the patient in the recumbent position, was simply fastened twice around the limb tightly enough to arrest the pulsation in the aneurism. This was left on one hour, and then two hours and twenty minutes of digital compression was used, without producing any change in the aneurism. The tubing was then reapplied for thirty minutes more with the effect of solidifying notably the tumour, but not entirely arresting the pulsation. Digital pressure was again resumed for one hour ; then thirty minutes more of the elastic tourniquet was resorted to, the aneurism still faintly pulsating—followed by eighty minutes of digital pressure ; again one hour of the elastic tourniquet—pulsation very dubious—followed by, finally, one hour of digital pressure, with a total

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[1] From a letter recently received from Prof. Monmonier it appears that the aneurismal sac was only partially emptied by the pressure of the bandage.

arrest of the pulsation. The treatment thus occupied eight hours, in which the tubing was used three hours. No anæsthetic was required. The man was 69 years of age; and the compression by the cord, being just sufficient to stop the pulsation, was not particularly painful.

The method adopted in the treatment of this case is in accordance with the views I have been led to entertain, and I should be disposed to recommend to others, as well as to practise myself, some such plan of *coups à coup*. To set it forth more explicitly, I should, in carrying out this treatment, advise the limb to be bandaged up to and above the tumour, but not over it, as it seems to me considerable advantage accrues from the aneurism being freely exposed so as to readily detect any pulsation. I still think well of having the patient in the erect position before the upper bandage is put on. The tubing I should prefer to have applied, as experience shows that, in some instances, the bandage, however tightly applied, failed to entirely control the blood-current. The constriction from the tubing should only be sufficient to thoroughly arrest the pulsation, and in many cases can be borne without the aid of an anæsthetic. In respect to the duration of the elastic compression, I should keep it on in my next case for two hours, and then apply a tourniquet tightly for two hours, and, if pulsation was still apparent, would repeat both the elastic and mechanical compression until success crowned my efforts. After consolidation has been secured, it is advisable to moderate the arterial current above the tumour for twelve to twenty-four hours thereafter, by either a tourniquet lightly applied, or, better yet, by a bag containing from seven to ten pounds of fine shot, secured *in situ* by strips of adhesive plaster.

No. 37 WEST THIRTY-THIRD STREET, N. Y.

ARTICLE III.

A STUDY AND ANALYSIS OF ONE HUNDRED CÆSAREAN OPERATIONS PERFORMED IN THE UNITED STATES, DURING THE PRESENT CENTURY, AND PRIOR TO THE YEAR 1878. By ROBERT P. HARRIS, A.M., M.D., of Philadelphia, Member of the Am. Philos. Soc., Fellow of the Coll. of Phys., Member, and formerly Pres. Phil. Obstetrical Soc., etc.

AFTER a search of nearly ten years, with several interruptions, I have so far completed my statistical work, as to be able to draw from it several valuable lessons for the guidance of future operators, who may be willing to receive instructions from the successes and failures of their predecessors, and anxious to improve upon their work for the good of suffering humanity. I have limited my remarks to one hundred cases, although there are a few in excess of it, in order that all the calculations of per-

centage may be in correspondence with any proportionate number given ; five cases representing five per cent., twenty, twenty per cent., etc., the one hundred operations being in the order of their occurrence.

Statistical medical work, to be of value, must not only be thorough and complete, but be separated from the dry detail of tables, and made to appear rather as a commentary upon them, after they shall have been carefully arranged for reference, than as a part of them.   I have already given much in the form of abridged reports and tabular records ; but, for the balance of cases, shall content myself with a statement of facts derived from them.   The collected record of all the cases will be preserved in book form, and eventually become the property of the Library of the College of Physicians of Philadelphia.   I have been particularly careful to obtain, as nearly as possible, all the published and unpublished records of the Cæsarean operation in this country ; and have so far succeeded, through a persevering correspondence, as to increase the printed record by 43 per cent.   By doing this I have largely augmented the list of fatal cases, but at the same time have greatly improved our knowledge of the causes which have led to the fatality of the operation ; a result which I regret to find has been frightfully on the increase in the operations undertaken during the last decade.

In studying the record collected, I find it highly important to separate the operation from its results ; crediting the operator, only with what he is legitimately chargeable, and resting the balance of the risk upon the delays, errors, etc., to which it properly belongs.   The operation of gastro-hysterotomy is a dangerous one in itself, but by no means so much so as our statistics would upon a superficial examination make it appear.   We have therefore three important points to consider :   1. What is the real danger of the operation, when performed with a due regard to the physical condition of the patient ; the time she should spend in labour ; and the safety of the fœtus ?   2. How much of the recorded mortality is due to the condition of the woman at the time of the operation ; the futile attempts at delivery through an impassable pelvis ; and the time wasted by delay ?   And, 3. What amount of fatality is directly due to the danger of incising the uterus of an exhausted woman ; the said organ having by its own muscular activity become materially changed in character, as shown in some instances, by an altered colour or density, or a total loss of the power to contract, when emptied of its contents ?

Muscular activity, under the power of the will in our voluntary muscles, first produces a swelling of the parts by the increased determination of blood to them ; then a sensation of fatigue, which becomes painful if long excited ; and secondarily after rest, a sore, contused sensation in the muscles used, when again brought into action.   In the involuntary muscles of the uterus, there would appear to be a progressive change, ending in a loss of contractile force, if not of destruction of tissue.   In some Cæsarean

operations the uterus has been found much thickened; in others of a chocolate colour; and in others in a condition approaching decomposition of substance. What changes ordinarily take place in the uterus during long labour can only be determined by a series of microscopical observations in subjects difficult of access; but whatever they may be, I am confident that they have much to do with the danger so markedly increased by delay in operating. It is a mistake to suppose that the great danger is in opening the abdominal cavity. This is done in a variety of surgical operations where the fatality is comparatively moderate; why then should it be so much more dangerous in a pregnant woman? Ovariotomy may be performed safely where there is a fœtus in utero; and a large proportion of laparotomy cases after ruptured uterus recover; where then is the danger in long delay in the Cæsarean operation, unless it be from the increase of risk in wounding a uterus changed by long activity, in an exhausted subject? The bearing of this view will be seen to advantage, when we come to examine our record of operations upon dwarfed subjects.

The condition of the woman to be operated upon, is to be considered in two aspects: 1st. What was it prior to the commencement of labour? And 2d. What is it at the time the operation is entered upon? The case may have been rendered unfavourable by previous disease, dwarfing or deforming the body; or by some present malady of more recent date; or be made much more serious than it otherwise might have been, by reason of futile attempts at delivery, or unnecessary delay on the part of a midwife, the accoucheur, or the surgeon himself, although we are glad to find that the last has rarely been chargeable with any uncalled-for postponement in our country, after having been called in to operate.

Dwarfed Subjects.—Of these we record nineteen. Sixteen cases were the result of rickets in childhood; one had an exostosis of the sacrum; another had lordosis and anchylosis, with the right thigh nearly at a right angle with the pelvis; and the remaining one was a member of a family of dwarfs. These varied in height from 3 feet to 4 feet 8 inches, and in weight from 65 to 115 pounds; and will readily be believed to have been unfavourable subjects for so severe an operation. If nearly one-fifth of this class of operations is to be performed upon women who have been rendered diminutive and feeble by rickets, then how important is it that their little strength should not be wasted by delay, or their cases made almost necessarily fatal, by craniotomy, version, or other futile efforts at delivery. It cannot be a very difficult matter to determine the amount of pelvic contraction in these cases, at least with sufficient accuracy to decide, whether or not the Cæsarean section will be found a matter of necessity; or of a wise election, as compared with craniotomy, embryotomy, and cephalotripsy. If, according to the investigations of Parry, whose decision I have verified by my own researches, it be correct, that craniotomy has scarcely a fractional advantage in saving life, over gastro-

hysterotomy, in cases where the conjugate diameter of the superior strait measures $2\frac{1}{2}$ inches or less; and not even this claim, when the latter is performed as it should be, very early in labour; then it becomes all important to make an early decision before the powers of the patient have been wasted, the fœtus perhaps lost or destroyed, and the case unfitted for the knife.

That a dwarf even of very diminutive stature may endure the abdominal section with success, we have in proof, by the report of the case of Ernestine Leher, of Brest, France, operated upon by Dr. J. Cerf. Mayer, on May 30, 1874. This rachitic subject measured but 91 centimetres, or $35\frac{7}{10}$ inches in height, and yet her life and that of her son Cæsar were saved by an early operation, she having been in labour but a few hours. Labour commenced in the morning; Drs. Mayer and Delattre were called in at $1\frac{1}{2}$ P. M.; found the conjugate $1\frac{6}{10}$ inches; summoned other consultants who confirmed their decision to operate, and the section was made at 3 P. M. (*Archives de Tocologie*, Paris, 1874, page 513). This commendable promptness of Dr. Mayer and his associates might well be imitated to advantage in our own country.

The conjugate diameter has been noted in 14 of the 19 dwarfs, and in only one instance did it exceed 2 inches, and in 10 of the 14, it varied from $\frac{5}{8}$ of an inch to $1\frac{3}{4}$. One would suppose very naturally, that under these circumstances it would be an easy matter to decide early, as to the necessity for the use of the knife; but what are the facts? By a careful examination, we can only rate 7 of the 18 operations as *timely*, and these saved 5 women and 5 children, all the seven children being alive when delivered but one. There were 8 women operated upon within 24 hours from the commencement of labour, all of whom recovered but 3, and 6 children were saved. The 3 women who died were all exceedingly small, viz., No. 5, was 3 ft. 6, white, conjugate $1\frac{3}{4}$, in labour 16 to 18 hours, but much exhausted before the operation. Her child was of full size, and lived; she died of peritonitis on the second day. No. 14, 3 ft. $6\frac{1}{2}$, white, conjugate $\frac{5}{8}$, a cripple and on crutches from early childhood, in labour 8 or 9 hours, died of exhaustion, escape of lochia into the peritoneal cavity, and commencing peritonitis in 20 hours. No. 19, 3 ft. 4, white, 65 pounds in weight, conjugate 2 inches; "operation early," woman died of peritonitis and degeneration of uterine tissue, in 5 days; child weighed 6 pounds, 20 inches long, and lived.

Eleven dwarfs were operated upon, on the second, third, and fourth days of labour, viz., 4 on the second day, one woman and two children saved; 3 on the third, one child saved; and 3 on the fourth, with one child saved.

In view of the fact that *but one dwarf was saved out of* 11 *who were operated upon, after the first day of labour*, it will be profitable to examine into the causes which led to so unfavourable a result as compared with that of the operations performed at an earlier period. I number the cases

in the order of their occurrence, simply as a matter of convenient reference.

No. 2, white, 4 ft. 1, conjugate diameter $1\frac{3}{4}$, was $3\frac{1}{2}$ days in labour, under care of a midwife; child dead, woman under febrile excitement before operation; died in 4 days of *peritonitis*. *No.* 6, white, in labour 30 hours, and much exhausted; woman died of *peritonitis* "in a few days;" child lived and grew up. *No.* 7, black, 3 ft. 6, conjugate $1\frac{1}{2}$, in labour 50 hours, and much exhausted; child 6 pounds, and dead; woman died of *exhaustion* in 4 hours. *No.* 8, white, conjugate 1 inch, in labour 4 days; craniotomy attempted, and promontory of sacrum punctured in three places, through the walls of the rectum, in mistake for the fœtal head; woman died in 6 days, from the *injury to the rectum;* child lived and thrived. *No.* 10 black, conjugate $1\frac{1}{4}$, time in labour not stated; child lived to age of 19; woman did well for 4 days, and was in a very fair way for recovery, when she threw herself into convulsions by a *dinner of dumplings*, causing her death in two hours. *No.* 11 white, 3 ft. 2, conjugate $1\frac{1}{4}$, in labour 42 hours, child 9 pounds, mother 70; craniotomy attempted, and persevered in for 3 hours, the woman becoming completely exhausted; died of *peritonitis* in $63\frac{1}{2}$ hours. *No.* 13 black, 3 ft. 9, five months pregnant; in labour nearly 2 days, brought on by an attack of dysentery, followed by peritonitis; woman had been operated on once before, and her child saved, after a labour of only $4\frac{1}{2}$ hours; she died in five days of the *pre-existing entero-peritonitis*. *No.* 15 white, in labour 3 days, two of them under the care of a midwife; craniotomy first performed by the operator, failing in which, he discovered the necessity for gastro-hysterotomy; woman died of *peritonitis* in 72 hours, as might have reasonably been expected. *No.* 16 white, 3 ft., conjugate 3 inch., spinal deformity, breech presentation, operation on third day of labour, after failure in version and trial with the blunt hook; woman died of *exhaustion* in $51\frac{1}{2}$ hours; child saved. *No.* 17 white, Irish, scarcely 4 ft. high, conjugate $1\frac{1}{2}$; advised to have an abortion produced when about half gone in pregnancy, but declined; in labor, at term, 3 days under a midwife, who gave ergot freely; pulse 120 before operation; inertia of uterus, hemorrhage, no uterine sutures used; died in 8 hours; no autopsy; hemorrhage thought to have returned; child dead. *No.* 18 white, 3 ft. $11\frac{1}{2}$, stout, 115 pounds, conjugate $\frac{7}{8}$; woman under observation of two accoucheurs from 9th hour of labour, but not operated on until in labour 38 hours, and much exhausted; the membranes were unruptured. The woman was very fortunate to recover under the circumstances; the child also was saved. With such a conjugate there was no question as to the form of delivery, and much danger in the delay in operating. This woman was not only dwarfed, but her pelvis was nearly closed up by an exostosis growing from the sacrum.

It is a little remarkable that of 23 dwarfs operated upon by the Cæsarean section in North America, whose cases we have on record, 18 were whites, and only 5 blacks, although rachitic deformity of the pelvis has been quite prevalent among the slave population in some localities of the South, particularly in parts of Louisiana; still, not one of the 18 operations credited to that State was performed upon what would be properly classified as a dwarf woman. There have been 10 operations upon dwarfs reported from the former slave States, and 6 of them were upon white women.

The record of Pennsylvania shows a majority of her Cæsarean subjects to have been rachitic dwarfs, or 5 out of 9 cases, with but one black; three of the four operations upon white dwarfs, by being performed early, were successful.

Our record of American Cæsarean operations upon dwarfs very clearly sets forth the value of early, and the risks of late, surgical delivery. A dwarf, being healthy, but inferior in powers of endurance, must have the advantages of an early, a very early, operation, if we expect to save her life; give her this, and she will, in the majority of instances, recover; exhaust her by delay, or a trial of impracticable expedients, and the record reads, "death by shock, exhaustion, peritonitis, or septicæmia." There is clearly an intimate connection between the condition of the patient at the time of the operation and the result; so much so, that by a record of the case up to the time of the incision, we can in a majority of instances give a correct conjecture as to the final result. *Dwarf No.* 12, now living, was operated upon in this State seventeen years ago, after a labour of only 2 hours, by the late Dr. Barnes, of Northampton County, and was already, in that short time, showing signs of becoming exhausted. What hope would there be in saving such a case even with but one day's delay? *Dwarf No.* 16, also of this State, was about the size of Dr. Mayer's case in Brest, already referred to, and might have been saved if delivered with the same promptness; but there were points of difference, which gave a hope of delivery through the pelvis in the latter, until too late to secure success under the knife. This excuse could not be given for the delay in cases where, even Dr. Barnes, of London, would admit that the operation by the knife was alone practicable. There must be a vast amount of ignorance in the land to account for the culpable management of the great majority of cases of labour in women with deformed or impassable pelves.

Rachitic women generally belong to the lower walks of life; and, from their position, in the large majority of instances, engage as their attendant in labour, either a midwife, often of the lowest grade, or an accoucheur who has but a very imperfect knowledge of the higher obstetrics. These people are often a long time before they recognize the fact that there is something serious in the case, and even then it does not occur to them that perhaps delivery *per vias naturales* is utterly hopeless; so they wait and wait, until friends become anxious, and they request a consultation, send for an accoucheur, a surgeon, or both, and finally, perhaps, a dozen doctors. The accoucheurs consult, try various expedients, waste perhaps some more valuable time, and at last decide that there is no hope but in the Cæsarean operation, and the patient submits to the use of the knife to obtain rest from suffering, in a condition of exhaustion which is calculated to make it in a few hours or days the *rest of death*. And then there is a grand hue and cry about the dreadful danger of the Cæsarean operation, and it is denominated the "*forlorn hope*," "*the last resort*," "*the most dangerous*

operation in surgery," etc.   "There's nobody to blame ; the surgeon was very skilful, and managed the after-treatment admirably ; but then the operation is so dangerous that scarcely any one recovers from it." What does the operator say, and what have a number of such written to the author of this paper?   "*The case was rendered hopeless by delay before I was called in; had I been summoned early, I have very little doubt but that the woman would have recovered.*"   A careful surgeon knows the importance of having his patient in as good condition as his disease or injury will allow before he operates upon him.   He is often weeks in preparing the case for the knife, because, by so doing, he hopes to save him from its effects.   An operation is not to be measured by the mortality that follows it, for the gravity changes with the condition of the case.   Tracheotomy is not a dangerous operation in itself, and yet death follows it much more frequently than gastro-hysterotomy, and so also is it the case with many other operations in surgery.   The real question at issue is, what is the true rate of mortality after gastro-hysterotomy under the advantages which a careful management of the case is capable of affording it?

Cases of African Blood.—I cannot find any ground for believing that the question of race has had any special bearing upon the mortality which has followed the Cæsarean operation in the United States.   At first it might appear that the blacks possessed an advantage over the whites in the proportion of recoveries to deaths ; but a close observation shows that this has been due to conditions which are not dependent upon any ethnical peculiarity.   The promptness, care, and skill often exercised by French operators under the slave system, gave, in many cases, an advantage to the black over the less fortunate white; but, where the circumstances are similar, the results have varied but little in favor of either.   52 white women and 48 blacks compose the 100 cases ; 18 whites and 26 blacks recovered, and 34 whites and 22 blacks died.   One-half of the saved blacks were in Louisiana, and ten of the 34 whites who died were dwarfs. In the last ten years five blacks out of six operated upon died.

Mortality of the Children.—Of the whites, 25 children were born alive, of whom 5 soon died ; and 27 were dead on delivery.   23 black children were removed alive ; 3 died, and 25 were dead on delivery.   There is in the profession a disposition to undervalue to a great degree the life of the fœtus as compared with that of the mother, and to sacrifice it for her benefit with very little hesitation ; hence, the popularity of the cephalotribe, especially in Great Britain, where it is used in exceedingly contracted pelves.   In many of the hundred cases the child was sacrificed to no purpose, and the case lost by the consequent delay and exhaustion. To save the child is often to save the mother, and, where the operation is timely, both are in the majority of cases preserved.   If more regard was paid to the life of the fœtus there would be more promptness in deciding to operate, and many less deaths to record against the operation.   In a

letter recently received from Dr. Thomas Radford, of Manchester, England, he says: "The salvation of the infant is a principle of first importance in my mind. The present practice seems to be running into the line of a destructive character. Craniotomy and cephalotripsy. . . . . The Cæsarean section should be considered an operation of election, and not one of necessity." Dr. Radford has twice operated, the first time thirty-five years ago, and has assisted in *four* other cases. He is the author of a work entitled "*Observations on the Cæsarean Section*," 1865, and a supplementary pamphlet, 1868, containing the records of 98 operations performed in his own country.

The cause of death of the fœtus from prolonged labour cannot be very satisfactorily determined, except in a few cases. We are obliged to attribute the deaths to uterine pressure as a general agent, but are forced to conjecture as to its method of application. We know that ergotic contractions, being more violent than those of a purely natural character, are very dangerous to the life of the child when seriously obstructed in its exit, and we infer that pressure is the element of danger, but cannot tell positively whether this is fatally exerted upon the brain, the bloodvessels of the body, or both. Where the fœtus lies transversely, and is bent laterally in the pelvis, death no doubt comes by obstructed circulation, aided perhaps by distortion of the spine and pressure upon the spinal nerves; but where the head presents, recent observers have attributed the death to pressure upon the cranium. One thing, however, is certain, death takes place in some cases at an unaccountably early period, and in others life is preserved during several days of active uterine effort. If the placenta and cord are so placed that they escape pressure between the uterus and fœtus, and the fœtal ellipse be well maintained, the child be perfectly developed, and the head prevented from undue pressure upon a small surface, I see no reason why it should not live a long time, even after the amniotic fluid has, in a large measure, escaped. I know that children do live through very long labours, and believe this the most plausible method of accounting for their preservation.

Of the 52 children delivered dead, 24 had been subjected to prolonged uterine pressure during the delay in delivery, 8 were destroyed by instruments, 5 were transverse presentations, and impacted in or upon the pelvis, 5 died before labour came on, the gestation having been prolonged, 2 were lost by prolapsus of the funis, 1 by ergotic contractions, 1 by convulsions in the mother, 2 were premature, and in 4 the cause was not mentioned or anything definitely given by which death could be accounted for. This degree of mortality is much greater than that of Great Britain, where 56 children were saved out of 98, although but 16 of the mothers recovered. Contrast the mortality of the fœtus in our 100 operations with the number lost in the cases operated upon on the first day of labour, and we find a vast proportionate difference in favour of the latter. 24 women are known

to have been delivered on the first day of labour; and there are reasons for believing that 6 others should be added to this list. Of the 30 children delivered from these women, 27 were alive, of whom 3 soon died, and 3 were dead on removal. Thus we have 30 operations saving 24 children, against 70 by which but 16 were saved, showing the great importance to the fœtus of an early operation.

Mortality of the Women.—Although it is by no means fair to charge the losses under the Cæsarean section to the operation, when in so many cases it was resorted to after the condition of the patient rendered it hopeless, it is of interest to know that notwithstanding the numerous instances of bad management, 44 women were saved, or four more than the number of children. What the proportion might have been we can estimate, by selecting *those who were in a favourable condition* at the time of the operation, and had not been more than a reasonable period in labour, but one of them as long as twenty-four hours. Of this class of cases I find but 24 in which the points mentioned are particularly noted, and out of this number 6 were lost and 18 saved, or 75 per cent.; all of the children being alive but 2, and 19 being saved, or $79\frac{1}{6}$ per cent. I was satisfied several years ago that this operation, performed under circumstances of time, health, and conditions calculated to favour it, ought to save in our country from 65 to 75 per cent. of the women and children, and, although I have nearly doubled the collection of cases since, and largely increased the proportion of deaths in the whole number, I still find my original estimate of promptly relieved cases to be correct.

Causes of Death in the Women.—We frequently hear of the great danger of death by *hemorrhage* under the Cæsarean operation; but this is a great error. There is an indirect danger from this source, but it does not arise from the amount of loss, but from the poison generated by the decomposition of, it may be, quite a small portion of escaped blood in the abdominal cavity. This is one of the dangers of a late operation, and seldom follows, when it is done early, for the simple reason that an exhausted uterus does not as a general rule contract well, or if it does, maintain the contracted condition so as to keep the uterine wound tightly closed. There is danger from hemorrhage in the operation, provided the uterus does not contract promptly after the fœtus has been removed, and especially in cases where the placenta is in the line of the incision, or the obstruction to delivery lies in a large uterine fibroid; but this accident of delivery has a remedy in ergot previously administered, in uterine palpation, the introduction of ice into the uterus, or in the failure of these, the closure of the uterine wound by silver wire sutures. In the 56 per cent. of deaths there are but four cases in which hemorrhage is recorded as a special element: of these two were affected with fibroid tumours; one in a crippled dwarf, and the other in a case of prolonged gestation, bearing a putrid fœtus, and having no distinct labour pains. The third was almost pulseless when

operated upon, and had been in labour four days ; and the fourth was under a midwife for three days, and dosed with ergot.   There may have been some secondary concealed hemorrhage in some of the cases recorded as having died of exhaustion, but in most of these women there was a condition of extreme prostration prior to the operation.

The term *exhaustion* is a convenient one for the cause of death, and a correct one in many instances, but a very unsatisfactory one in others, especially where the woman has survived the operation several days.   15 deaths are attributed to this cause, all in cases of prolonged labour, the time varying from 26 hours to 15 days.   7 died within seventeen hours ; 4 on the second day ; 2 on the third ; 1 on the fourth, and 1 on the sixth.   I believe that an element of septic poisoning exists in some of the later cases of apparent "shock and exhaustion."   A woman is prostrated by a long labour, and is operated upon in this condition ; if she does not fall a victim to the shock to the nervous system, in a few hours, she will perhaps rally a little, remain weak and almost pulseless a day or two and then die.   She may die simply of the exhaustion and shock ; but make an autopsy, and you will find pathological changes in the uterus and abdominal cavity that indicate other complications ; the uterine wound is open, and it may be slightly gangrenous ; there is at least little or no attempt at union ; there is a bloody fluid in the abdomen, it may be in very small amount, and there are evidences to the eye of a congestion or slight inflammation of the peritoneum ; the heart also, if opened, will perhaps present a fibrinous clot of recent formation, indicative rather of the method of death than of any real cardiac disease.   To avoid this condition, there is only one remedy, *operate early*.   Look at the timely cases in our American record, and imitate the promptness with which they were undertaken.   Why were Prevost, Gibson, Hoffman, Scudday, Mills, and others so successful ? because of the fact that their patients were in labour but a few hours before relieved of exhausting suffering.

Peritonitis is the great dread of the abdominal operator, although gynæcologists are becoming much less afraid of exciting it than in former years. It is certainly much to be feared in gastro-hysterotomy, and will make its appearance even where the condition of the patient was favourable at the time of the operation.   But there is this consolation, it may be avoided in large measure by an early resort to the knife whilst the patient is still strong, and the uterine contractions active.   It is a form of inflammation that finds its home in exhaustion, being of the adynamic type in many subjects, like its near relative, erysipelas.   Eighteen operations resulted in peritonitis and death, only four of the women having been in labour less than a day ; the other fourteen varying from a little more than twenty-four hours to nearly four days.   But one of the four cases in women operated upon early, presents no assignable reason for the attack.   No. 18 of my case-book was a dwarf of 3 feet 6, and exhausted before the operation.

No. 94 was but 3 feet 4. No. 61 was in delicate health, and had also her ovaries removed in the operation. But No. 41 was in good condition, had a timely operation, and still fell a victim to peritoneal inflammation in a little over four days.

There is certainly a very marked connection between a long delay before the Cæsarean section is made, and a peritonitis as an after result. There are exceptions both ways, a prolonged case escaping, and an early one being attacked; but the general rule favours the timely operation. We can readily see how an exhausted patient would die of shock and exhaustion after an operation of so grave a character, but how prostration of system favours an attack of peritonitis we cannot so readily comprehend. We have seen repeated attacks of erysipelas follow a wound in an enfeebled subject (in one case seven times), and as the two forms of inflammation very nearly resemble each other, we infer that debility favours the approach of either. Another element that enters into the production of peritonitis is the sensitive condition of the uterus after a long labour to traumatic inflammation when incised. As a contused muscle is not a good one out of which to make a flap in an amputation, so the uterus, when affected by pressure upon a resisting fœtus, is not in a safe condition to incise, as such an interference may bring on metritis, metro-peritonitis, phlebitis, or septicæmia. In early labour there seems to be much less risk.

It will be profitable to note the conditions of 13 women, prior to the operation, who afterwards fell victims to peritonitis, viz.: No. 9 exhausted by an attempt to deliver by craniotomy. No. 13, in labour $3\frac{1}{2}$ days under a midwife—exhausted and feverish. No. 14, in labour 2 days under a midwife, imprudently got out of bed on 5th day—died on 8th. Nos. 21, 23, 24, 55, 73, 80, 81, and 87, all protracted labours. Nos. 50 and 84, both long labours, with craniotomy; 84, two days under a midwife, and one additional under an accoucheur. Two women died on the second day, six on the third, two on the fourth, one on the fifth, one on the eighth, and one on the tenth. The one who rose too soon was not attacked until the fifth day after the operation.

Septicæmia, as a cause of death, is reported in only two instances, which I believe to be far from the truth, although unintentionally a misstatement. A woman, after a culpably long labour, with perhaps a failure in craniotomy or version, endures *in extremis*, or near it, the Cæsarean section. She is relieved by the removal of the fœtus; rallies somewhat; lives a few days in a weak condition; has some peritoneal symptoms, and dies. One observer calls it a death from shock, another exhaustion, a third peritonitis, and a fourth septicæmia, when perhaps, as is the case in the large majority of instances, no autopsy was permitted to be made. What is the real cause of death? We open the body of a woman, and find scarcely a sign of peritonitis, at least apparently not enough to occasion her death; but the uterine wound is open, its edges are unhealthy, there are evidences of slight gangrene in them, and perhaps pus escapes under pressure: there is

also more or less blood in a state of commencing or advanced decomposition in the abdominal cavity ; and an unhealthy-looking matter in the cavity of the uterus. Here are exciting causes enough for septic poisoning. Did the woman die of it? The microscope, and a careful minute examination of the uterus, and a few remote organs and their vessels, must determine this. If the blood found, or the escaped uterine discharges, are the *fons et origo* of the condition that has led to death, then how important to secure the uterine wound by sutures, and establish a proper drainage *per vaginam* to prevent such a mishap. If the uterus will contract sufficiently well in the early hours of labour to avoid this necessity, then how much better to operate in good season and obtain this advantage. Inflammation which has no element of septic poisoning, is not necessarily fatal, and a patient may recover even when the attack has ended in the formation of an abscess, as in case 22, where the patient had been in labour only a few hours. In a second operation the recovery was without any special element of danger. Inflammatory sequelæ are not uncommon in cases of early operation, but they are of a more healthy type than after late ones, and much more seldom end in death. Evidences of local peritonitis ending in the formation of adhesions have been discovered on several occasions under second operations, where the symptoms of the peritoneal implication were not all pronounced at the time of the attack.

Previous disease may so weaken the body and impair the health, as to render the Cæsarean operation much more than usually serious. In Europe, the usual depressing malady is mollities ossium, which we fortunately have not to contend with in the United States. Here, what is most common, is a delicate, deformed frame, the effect of rachitic growth in childhood, leaving the woman with a depressed power of endurance. Albuminuria—fibroid growths in the uterus—coxalgia—dysentery—intermittent fever—and prolonged gestation from occlusion of uterus, are recorded as existing in patients prior to operation in the United States. Of six cases of fibrous tumour, four intra-uterine, and two pelvic, all died but one of the latter, who had also intermittent fever : she was operated on when in labour fourteen hours. Of four cases of *eclampsia*, all died but one, which was not uræmic ; children were all lost. There were three cases of *prolonged gestation*, one of about forty-four months, one twenty-one or twenty-two, and one several weeks over time. In all, the fœtus was putrid, and the patients in bad health. In two there had been local peritonitis, and the adhesions enabled the operator to open the uterus without exposing the abdominal cavity—these women recovered ; the third brought on peritonitis by folly in eating, about the tenth day, and died. All had inflammatory occlusion of the os uteri. It is a question whether these women might not have been operated upon by hysterotomy,[1] as this

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[1] See two cases of this operation on same woman, with success to her and the children, by Mr. Alexander Tweedie, in *Guy's Hospital Reports*, vol. ii. p. 258.

operation has proved successful even where there was no appearance of an os discoverable : the section can be made under eye by the aid of a speculum. Fibroid tumours are not necessarily a fatal complication in gastrohysterotomy, although no woman with such an obstacle to delivery within her uterus has survived the operation in the United States. If the tumour should be seated low down in the posterior part of the organ, and the operation be performed early, the hemorrhage ought to be controllable by wire sutures, and the patient saved. Dr. Cazin,[1] of Boulogne, France, operated in a case in 1874, on the fourth day of labour, and although there was inertia of the uterus, and the woman fainted from the hemorrhage, he was enabled to arrest it entirely by five uterine sutures of silver wire, and both mother and child survived. After the operation the fibroid commenced to diminish in size.

Uterine sutures have been employed in fifteen cases of Cæsarean section in the United States (see account of cases in this *Journal* for April, page 326). In a letter recently received from Dr. James Parrish, of Portsmouth, Virginia, reporting a case which he believed to have died from hemorrhage, he remarks : " My decision not to use uterine sutures was mainly determined by the very decided attitude of Cazeau upon this point. Yet that it is very bad practice, indeed, I have now no manner of doubt." The woman had been in labour under care of a midwife for three days, and ergot freely administered—hemorrhage was quite free from the uterine incision, and difficult to arrest, as the uterus was slow in contracting—ice was used with effect, but it was thought that the uterus must have relaxed after the abdomen was closed, as the patient sank, and died in eight hours. Similar cases have been saved by the silver-wire suture. In no *timely* operation except in one instance were sutures required, and in this one, the knife had cut through an intra-mural fibroid, which caused the wound to gape open.

Antiseptic Treatment.—This includes a variety of expedients to prevent blood-poisoning. 1. Sponging out the cavity of the abdomen, and in cases where the fœtus has been putrid, the uterus also. 2. Drainage through the vagina, abdominal wound, or both, by Chassaignac's tubes, or Winckel's mèche, and the use of the syringe to wash out the discharges. 3. Keeping open the lower part of the abdominal wound for inspection, and escape of noxious fluids. 4. The use of Lister's dressing to the abdominal wound. 5. The employment of the irrigator to the abdomen, to keep down the temperature of the body ; this saved a very unpromising case at the hands of Dr. Fowler, of Alabama, in 1866, after a labour of sixty hours (see case 52, April number), the patient being not only exhausted, but anæmic from loss of blood. 6. The re-opening of the abdominal incision for the removal of escaped uterine discharge, or purulent accumulation, and syringing out the cavity containing it : this was done

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[1] Archives de Tocologie, vol. i. 1874, p. 704.

in 1827, by Dr. Richmond, of Ohio, who thereby saved his patient (case 2, April number).

Cæsarean Operations Increasing in Fatality in the United States.— Instead of progressing toward success in latter years, as all the other varieties of abdominal surgery have been, we have been most decidedly retrograding, under the instruction of those who teach that gastro-hysterotomy is to be regarded as the "last resort," and never an operation of election, if there is a possibility of delivery by cephalotripsy, even although it may rightly be considered equally dangerous to the mother. This leads to experiments, failures, loss of time, and a delay that is very often fatal. To demonstrate the fact of retrogression, I have divided the last forty years into its four decades, and present the following as their respective records, viz. :—From 1838 inclusive, to 1848—8 operations—4 women recovered, 4 died, 5 children delivered alive, 3 *timely operations.* . . . 1848 to 1858—27 operations—13 women recovered, 14 died, 15 children delivered alive, 8 *timely operations.* . . . 1858 to 1868—23 operations—13 women recovered, 10 died, 8 children delivered alive, 5 *timely operations;* 8 cases with no deformity of pelvis recovered, four being cases of impaction of the fœtus in the transverse position; two, vaginal occlusion; one, impaction of the rectum with clay; and one, impaction of fœtal head in the pelvis, a very unjustifiable operation. This accounts for the greater mortality in the children. . . . 1868 to 1878—27 operations— 4 women recovered and 23 died, 13 children delivered alive and 14 dead, *timely operations* 5; remainder, 2, 3, 4, 7, and 15 days in labour, there being three of the last. The manner of death as recorded, is indicative of the effect of long delay, *i. e.,* peritonitis 8, exhaustion 8, hemorrhage and exhaustion 2, septicæmia 2, etc. Here we have again the evidences of the importance of an early resort to the knife, its value in saving life; and the danger of a long labour in making recovery almost impossible. View the subject in all its aspects, and we find that it leads us to the same point. There is a fair prospect of saving both mother and child by an operation during the first hours of labour, and this hope diminishes as labour advances, until there is a marked falling off; and, finally, the prognosis becomes exceedingly unfavourable, as very few escape. Until these facts become generally known to the midwives and obstetricians of the United States, we may still expect them to act in the same way as they have so long done. The ignorance displayed in managing the cases during the last ten years, and their frightful mortality, are both discouraging and appalling. It is also disheartening to find that 10 of the worst cases of delay ending in death, were under treatment in cities, in several of which are medical schools. Eight were cases of deformed pelvis, and two of exostosis. They were in labour from two to four days or more—two were two days, five were three days, one was four days, one was "several days," and one "exhausted by long labour." How many of the twenty-

three women whose cases were fatal during the last ten years were first under the care of a midwife, I am not able to say: in five, the fact that they had been, is mentioned, but it is fair to presume that the delay commenced with them in quite a number.

Hospital Cases.—As yet, but two operations have been performed in the hospitals of the United States, and both cases died because of delay. There is no reason why cases might not do well in hospitals; and it is a pity that the poor and ignorant could not have the benefit of hospital skill from the moment of falling in labour, and thus escape the dangers of malpractice under stupid midwives. The experience of Paris is not in favour of hospitals, as they have not been successful in that city, for reasons, one of which will be learned by the following report of Dr. M. M. Rogers to the *Buffalo Med. Journ.*, in June, 1851:—

In January, 1851, a rickety dwarf of 24 years of age was taken in labour at the Hospital Clinique des Accouchemens, of Paris, the waters soon broke, and after a labour of six hours, finding a conjugate of $1\frac{1}{4}$, the chief called in the late Baron Paul Dubois, who with Prof. De Paul consulted upon the case, and decided that the Cæsarean operation must be performed. The woman by this time (9 P. M.) was becoming exhausted; her child was living, and she required as early relief as possible; but instead of operating at once, they postponed doing it until 10 A. M., when it took place with due skill and quickness in the amphitheatre before the class. By this time (nineteen hours labour) the child had perished, and the woman was much exhausted. She sank after the operation, to die of collapse in 36 hours.

In the April number of this Journal I related an exactly similar case for the same hospital, that ended in the same way; the consultants being Drs. Cazeau and Moreau, and the latter the operator. The operation took place in 1837, and had been postponed over twenty hours, making the labour 36 hours—death in same way, but much sooner. The women and children were lost, but then the class saw two beautiful operations. As I have no fear of our surgeons sacrificing humanity to science in this way, this hospital objection is not any obstacle to success here. The difficulty lies in securing the patient in time, whether for private or hospital treatment.

Induction of Premature Labour, as a Method of Escape from the necessity of Performing Gastro-hysterotomy.—This is a very beautiful plan in theory, but not at all easy to put into practice. There are many women of the better class who may be so contracted in the pelvis as not to be able to bear a living child at term, and yet who are far from requiring that the Cæsarean operation should be performed. To such women, the saving of a living child by an artificially excited labour, at an early period, consistent with viability, is a great blessing; and the proposition to perform the operation, is one that appeals to their sense of reason, and is often responded to accordingly. But the subjects of infantile rickets are usually

of a different class, and much less likely to be properly impressed when appealed to in adult life after they have become pregnant. Besides, in many cases it would be impossible to remove a viable fœtus because of the excessive deformity, a space of $2\frac{1}{2}$ inches conjugate being required, according to Kiwisch, for one of the 30th week to pass through. In several instances the attempt has been made to induce deformed women to submit to an abortion, and they have almost uniformly declined, and this has been done even after they have on a former occasion been obliged to endure the risk and suffering of the Cæsarean section. I will illustrate these facts by two examples. In June, 1877, Prof. Edward W. Jenks, of Detroit, delivered a German woman of 24, by the Cæsarean operation, after a labour of 7 days, during which time she had been in the hands of a party of women, assisted finally by a midwife. The woman had a deformed pelvis, and the child's arm protruded; she made a very remarkable recovery. Last spring she was pregnant again, and Dr. Jenks, in order to avoid the risk of a second operation, tried to persuade her and her husband to let him bring on labour prematurely, but to no purpose. They were both stupid and ignorant—the husband did not want " to have the baby disturbed"—and the wife said she would run all risks. Fortunately the fœtus died, became putrid, and she aborted. . . . In May, 1875, Dr. James Parrish, of Portsmouth, Virginia, was consulted by an Irish primipara, scarcely 4 feet high, deformed, having a conjugate of $1\frac{1}{2}$ inch, and about half advanced in pregnancy, as to the possibility of her being delivered at term ; and he advised the immediate production of abortion, which she declined from religious scruples. In September she placed herself under the care of a midwife for delivery, ergot was freely given, and after three days' trial Dr. Parrish was sent for. She survived the Cæsarean operation eight hours. If we could give such people the requisite degree of intelligence, we might hope to be able to induce them to submit, by demonstrating the abnormal anatomy of their pelvis; but the words would be as an idle tale, as they evidently were to these two white women of foreign birth. Other instances of a declination of a similar character might be mentioned.

What is a Timely Cæsarean Operation ?—The record of cases examined clearly establishes the fact, that a section to be in season to save both mother and child should be early. If a dwarf begins to show signs of exhaustion after labour of from two to six hours, then her operation should take place, according to this measure of time, if the labour is active; it may be as late as ten or twelve hours, if she is strong and has a good pulse. When the os uteri is sufficiently opened for drainage, the case may be operated upon. As a general rule, the earlier the operation, the more likely is the patient to recover. Women who have not had rickets and are well grown and robust, can bear with safety a much longer delay, as shown in the results of operations for impacted fœtus. I thought at one time that an operation within the first day of labour should be

esteemed early; but the reports of cases of women exhausted within this period, have caused me to alter my views.

Operations of Election.—Great as are the admitted dangers of craniotomy, cephalotripsy, and embryulcia, to the mother, there are those who appear to hold to the opinion, that we should never make choice of the Cæsarean operation, if the fœtus can by any possibility be delivered *per vias naturales.* We have had women in the United States who endured several hours of suffering under craniotomy, and narrowly escaped with their lives, who were afterwards delivered safely of living children by gastro-hysterotomy. In 15 of the 100 cases reported, the operation was predetermined on account of former, or anticipated difficulties, and the same arranged for, by the operator. In 13, the women recovered, and all of the children were delivered alive but one, the child presenting by the arm. In five instances the Cæsarean operation succeeded a former delivery by embryulcia, as an operation of election, and all the women and children were saved. Dr. W. S. Playfair says, in his treatise on Midwifery:[1] "Great as are the dangers attending craniotomy in extreme difficulty, there can be no doubt that we must perform it whenever it is practicable, and only resort to the Cæsarean section when no other means of delivery are possible." This is the generally accepted doctrine of the English school of obstetrics of the present day, although Radford, Greenhalgh, and a few others are opposed to it. Denman and Meigs questioned the propriety of repeatedly performing craniotomy in the same woman, and the latter was one of the first to act upon it in the United States, when he refused thus to deliver Mrs. Reybold in her third labour.

Dr. Playfair says, "he would be a bold man who would deliberately elect to perform the Cæsarean section on such grounds;" and I am happy to answer, that we have had several such bold men, and that they were repaid in a remarkable manner by success. What better trophy could Dr. Meigs, if now living, present, than Mrs. Reybold, with her two children and six grandchildren, as the fruits of his declining, in 1835, to destroy any more children for her? There can be no question now, but that Mrs. R. not only suffered far more in the two craniotomies, and was in more danger afterwards, than from the two operations of Prof. Gibson.

In view of American success in cases of election, we must object to the opinion of Dr. Playfair being applied to American subjects. We do not claim that they are in any greater danger from craniotomy than English women, but do, that by reason of climate and condition, the Cæsarean section is much more promising of success when seasonably made, than in Great Britain. We must claim the privilege of election where we find a deformed pelvis having a conjugate diameter of $2\frac{1}{4}$, and in some cases of $2\frac{1}{2}$ inches, where there has been no opportunity in the proper season for delivery by induced labour. The late Dr. Parry, after having been nearly

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[1] Science and Practice of Midwifery, American edition, 1878, p. 502.

seven hours in delivering a woman by craniotomy, who had been thus delivered before, and who narrowly escaped death from peritonitis after his operation, told me that he had determined in case of her being again pregnant, to perform the Cæsarean operation, as more simple, less dangerous, and possessing in addition the important advantage of preserving the child. He unfortunately did not live to put his opinion in practice, and possibly might not have had the opportunity, as the woman in her next labour did not call in competent advice until too late; she was operated upon by craniotomy, and died of blood-poisoning.

Laparo-Elytrotomy.—Although Dr. Thomas did not originate the subperitoneal substitute for gastro-hysterotomy, the credit of opening the vagina by laceration to avoid hemorrhage belongs to him. He would have us believe that this mode of delivery is infinitely safer than the Cæsarean section, which, for one, I am not at all inclined to credit. I admit that it would appear to be much safer in cases of prolonged labour, in which it is dangerous to incise the uterus; but do not believe that it will prove to be any less dangerous than the Cæsarean operation performed as it should be, early on the first day of labour. Gastro-hysterotomy is an operation of a very duplex character; as a timely method of delivery, it has a mortality of 25 to 30 per cent.; and as one of "the last resort," the deaths very far outnumber the recoveries, having been six to one in New York City. The record of the last ten years shows that Dr. Thomas's substitute is a much needed one in many of our large cities, where the poor deformed victims of rickets are so apt to begin their labours in charge of some ignorant midwife or third-rate accoucheur. In such cases we should recommend Dr. Thomas's operation, so as to avoid the risk of opening the uterus by incision. This operation will no doubt be tested at home and abroad in a few years, and we can then learn its relative safety when brought into comparison with the Cæsarean section performed in the early hours of labor. If rickety women will go to ignorant midwives, then we should give them the advantage of Dr. Thomas's improvement on Ritgen's operation.

From the way in which statistics have been drawn up, by grouping all the cases together, and then taking the general average, the Cæsarean operation is credited with a mortality of 56 per cent., or thereabouts, as with us in the record presented. But this by no means represents the danger of the operation *per se*, as shown by a series of properly conducted cases, many of the balance being either exhausted, *in extremis*, or moribund at the time of the operation, as stated by their reporters. Dr. Playfair, in his Midwifery, very justly remarks: "Until we are in possession of a sufficient number of cases performed under conditions showing that the result is obviously due to the operation, in which it was undertaken at an early period of labour, and performed with a reasonable amount of care, it is obviously impossible to arrive at any reliable conclusions as to the

mortality of the operation." Kayser estimates the mortality from second operations on the same women at 29 per cent.; in the United States it has been 25, or 2 women lost out of 8. The two lost were both in bad health, and one almost hopelessly diseased; hence their death. One-fifth of the operations in the United States were performed after from 2 to 15 hours of labour, and 3 out of 4 women were saved (15 out of 20), with 18 children.

Records according to States.—Louisiana presents several cases prior to the operation having been done in any other State. Her oldest living operator is Dr. Thomas Cottman, who has twice made the section with success, the first in 1832. Ohio stands second on the list, her first case a success, in 1827; Virginia is the third in order, in 1828; next Pennsylvania, in 1832, the operator, Dr. James S. Dougal, having lived until a few months ago; then Tennessee, in 1837, the operator, Dr. John Travis, I believe, being still alive; then New York, in 1838, operator, Dr. Richard K. Hoffman, etc. *Louisiana* presents probably the most remarkable record of any country, 18 operations, 14 women and 10 children saved. Half of the cases had never been published. 3 women were operated upon twice, and all recovered, five of the children being delivered living. *New York* comes next in numbers; 13, but a great contrast to Louisiana—11 women lost, and 9 children; nearly all the women exhausted, or *in extremis*, before the operation. *Pennsylvania* has had 9 cases, with 4 recoveries, and 5 children saved. Four cases were dwarfs, three saved. *Alabama* has the same number as Pennsylvania, viz., 9, the oldest case (1848) having been received last, and quite recently; operator, the late Dr. William M. Boling, of Montgomery. Women, 8 black and 1 white; 6 blacks died, and the white woman recovered; 3 children delivered alive, and one soon died. Not a very flattering record for the ethnical theory, in favor of the African race being better subjects than the white for this operation. Compare with *Ohio*—8 women operated upon, all whites, two of them small dwarfs, 6 recovered, and 5 children delivered alive. *Virginia* reports 7 operations—5 blacks, one lived—2 whites, one lived; 3 children delivered alive. *Mississippi* presents a record of six cases, three operations on the same woman, who died after the third; all the others died; no whites operated on; 6 children delivered alive, and one dead; one had twins living, an extra-uterine, and intra-uterine fœtus. As an offset against this record, *Indiana* reports six operations, on five whites and one black; of whom only the black and one white recovered. Two children were saved, whose mothers died, and the balance were lost.

Of the remaining States, Michigan and Missouri have each had 3 cases; Arkansas, California, Connecticut, North Carolina, and Wisconsin, each 2; Georgia, Iowa, Kentucky, Maine, Maryland, Massachusetts, Tennessee, and South Carolina, each 1.

Concluding remarks.—I think it will be admitted that I have made a

critical analysis of the one hundred cases, such as they were reported. Had they been perfectly presented to me in all points, I could have been more decided in some of my calculations, but there were deficiencies here and there which could not be filled up, although many in the published cases were supplied by correspondence. I should like to have had the age of every case, the *exact* time in labour, the pulse and temperature before the operation, and after it, etc.; but there were many gaps or unsatisfactory statements, although nothing very vital was omitted. The colour of the woman, and result to her and child after the operation, were always directly or indirectly reported. A want of definiteness is too common in such records, "a few hours," "long and tedious," and "several days" being used instead of exact numbers, which would be much more satisfactory when life often depends upon a measure of time.

My attention was attracted some years ago to the study of the Cæsarean operation in our own country, by the remarkably favourable results that had followed in some cases with which I was familiar, and the directly opposite termination of the section in others. This led to the examination of the causes of this difference, and the formation of an opinion which has grown stronger by investigation, and has stood the test of a careful examination of the whole American record. My researches taught me that we were greatly in error in the United States in the management of cases of extreme pelvic deformity; were too much afraid of the Cæsarean section; followed too much the teachings of English obstetrical books, whose opinions are based upon the statistics of Great Britain; added largely to the fatality of the operation by delay; and did not regard or know the value of the instruction to be derived from the records of a number of timely and successful operations that had been performed in our own land. It is very natural that I should wish these facts to be disseminated, as we are dealing with a humane subject, and many lives may in future depend upon the truth being known, as to the relative value to the mother and child, of a *very early*, a *moderately late*, and a *very late* Cæsarean operation.

A very early operation in the United States will save about three out of four women, and as many children; a moderately late one will lose about two out of three women, and one-half of the children (this calculation is based upon the results of the cases of 15 women, who were in labour from 18 to 44 hours); and a very late operation, that is from two to fifteen days or more, after the commencement of labour, will lose three, four, or five to one, according to circumstances. Judging from the fact that delays are unaccountably made by accoucheurs, in cases where the operation would seem to be inevitable, we must, if charitable, believe that they cannot know the value that even an hour lost may be to the woman and child.

Dr. Thomas Radford was kind enough to send me several years ago his records of the Cæsarean operation in Great Britain and Ireland, which I

have a number of times examined, but never so critically as of late. These show a very mysterious difference in relative mortality as compared with our own work. There were 20 operations in cases where the labour lasted from 5 to 18 hours, and but 4 women were saved, although but 4 children were lost. In the United States we should expect to save from 60 to 70 per cent. of both. In these twenty, we find three cases of rickets, nine of mollities ossium, two of exostosis of sacrum, two of epithelioma of the cervix, one of cancer of the rectum, one of fibrous tumour of the pelvis, and one of medullary tumour. The two women with exostosis recovered, and also one having mollities ossium, and one epithelioma of the cervix.

There is something marvellous about this rate of mortality in *timely* British operations, as the advantage is but a small percentage over the general run of cases, or as one death in five women to one in $6\frac{2}{3}$. By extending the limit of time in labour to twenty-four hours, I find in the same tables 25 operations, with 6 women and 19 children saved, an equivalent of 24 and 76 per cent. as compared with 16 and 57 in the general average. With twenty-five operations under the twenty-four hour limit in our country, we should expect to save from 50 to 60 per cent. of both mothers and children. So it will be seen that the results of gastro-hysterotomy are quite different in the two countries. We often hear the mortality of the operation in England attributed to delay, which we see is justly chargeable with only a fractional difference. If all the operations in the two countries were to take place during the first twelve hours of labour, I should expect the result to show less than five women saved in Great Britain for ten in the United States, and the proportion of children to be about the same, or 75 to 80 per cent. in each country.

What makes this difference? We cannot account for it, as I have shown, by delay. We might attribute it to the existence and prevalence of *mollities ossium* as a cause of difficulty, but for the fact that cases of rickets do not seem to have done any better, and that one-fourth of the saved women were affected with cancer. It cannot, then, be, except, perhaps to a very small degree, dependent upon differences of disease. But three causes remain: 1. Difference of skill; we claim nothing here. 2. Difference of climate; we have certainly the advantage of dryness. 3. Difference of habits; here is probably one great basis of advantage, for we have no beer-drinking female peasantry, as in England, to be the subjects of the operation. But then again look at the results in ovariotomy under Spencer Wells, Keith, etc., which are not inferior to our own. This may perhaps be accounted for on the differences of social position between the great majority of the subjects of the two operations, the Cæsarean operation being almost entirely confined to women of the lowest classes, who, by poverty of living, have become the subjects of deformity of the pelvis, either in childhood or adult life. Dampness of climate, extreme poverty,

and beer-drinking appear, then, to be the only assignable causes for the difference of results to the women of the two countries.

The opinion of London obstetricians, based upon the results of their Cæsarean cases, is decidedly hostile to and condemnatory of the operation, and is highly in favour of the cephalotribe, which is not to be wondered at, for under similar circumstances we should be tempted to hold the same views. The few who are in opposition are inclined to condemn the use of the cephalotribe as dangerous, and to defend the Cæsarean operation because it generally saves the child, who is entitled to its life; and although not favourable to the life of the mother, does save a small fractional percentage, which care and promptness might increase under favourable hygienic treatment and the avoidance of stimulants.

The Operation.—Although I shall not attempt to describe the steps of the operation, there are points to which it may be well to call special attention, in view of the teachings of the past.

1. The nearer the abdominal incision is made to the central line of the linea alba, the less will be the hemorrhage.

2. The earlier the operation, the better for the safety of the mother and child.

3. Chloroform, by leading to uterine inertia, and vomiting, is an unsafe anæsthetic. Local anæsthesia by spraying the line to be incised is safer.

4. The best sulphuric ether is a safer anæsthetic than chloroform.

5. In the days before the use of anæsthetics, the Cæsarean operation was safer than now, as there were no secondary anæsthetic effects.

6. The operation is not very painful after the skin has been incised; this is painful, and feels like burning with a hot wire. The stitching is the most severe.

7. To arrest uterine hemorrhage and prevent its return, suture the uterus with silver wire stitches.

8. Ice is a good remedy for exciting uterine contraction, and much safer than the persulphate or perchloride of iron. Vinegar is also a valuable excitant, and acts promptly. Ergot is a good preparative to avoid inertia.

9. The abdomen should be thoroughly cleared of all the blood and amniotic fluid which have escaped from the uterus during the operation.

10. Septic poisoning is apt to originate in the decomposition of matters that have escaped from the uterus, even when in small quantity.

11. Many women lose their lives through post-partum uterine relaxation ending in hemorrhage. To avoid this, operate very early and without anæsthesia. In all late cases, suture the uterus with silver wire for safety.

12. Where the uterine drainage is not good, leave the lower part of the abdominal wound open, and syringe out the abdominal cavity with dilute

liq. sodæ chlorinat. f℥ij to Oj, or bromo-chloralum one part to forty or fifty of warm water, daily.

13. Never use catgut for uterine sutures; as the knots become untied, the wound opens, and patient dies.

14. If the temperature of the room is high, the wound may be kept open until the uterus is safely contracted, all bleeding arrested, and parts cleansed. In one case the wound was not closed for an hour, and the patient recovered.

15. If the fœtus is dead and putrid, sponge out the uterus carefully and put five or six sutures in it. It is safer to do this than run the risk of secondary hemorrhage or escape of lochia into the peritoneal cavity. Two women, seven and ten days in labour, were thus saved in the United States, and are now alive and well.

713 LOCUST STREET, PHILADELPHIA, Nov. 15, 1878.

ARTICLE IV.

ON THE TREATMENT OF MORBUS COXARIUS BY A NEW METHOD OF EXTENSION; THE PHYSIOLOGICAL METHOD, WITH CASES. By JOSEPH C. HUTCHISON, M.D., Surgeon to the Brooklyn (New York) City Hospital, Surgeon-in-Chief to the Brooklyn Orthopædic Infirmary, etc.

I PROPOSE in this paper to describe a plan for the mechanical treatment of morbus coxarius, which I have practised for some time past, and have found to be simple, efficient, and comfortable to the patient. Whether it is better than the methods hitherto used I must leave those to decide who may be induced to resort to it.

It is not necessary for my purpose to consider whether the mechanical appliances that have been used in this country for the last twenty-five years, or the more recently devised apparatus of Thomas, of Liverpool, accomplish the indications for which they were designed. The point which I wish to make is that they are unnecessary, that they are cumbrous and uncomfortable, and should therefore be abandoned, provided that equally good results can be obtained by simpler means. The indications for the treatment of morbus coxarius, as I understand them, are (1) to secure immobility of the joint; (2) to procure extension of the limb; (3) to take off from it the superincumbent weight of the body; (4) to provide means to enable the patient to take exercise in the open air.

To secure immobility of the joint no apparatus is necessary.

Fixation of the joint is one of the earliest and most characteristic symptoms of morbus coxarius. This is secured by reflex contraction of the peri-articular muscles, aided by intra-capsular effusion, and the voluntary

effort of the patient to keep the joint at rest, on account of the pain which motion produces. The rigidity of the joint is so great that when we move the limb the pelvis moves with it—there is apparent anchylosis. This continues until nature says immobility is no longer necessary; but, so long as it is necessary, she secures it better than we can by any artificial appliances. Therefore I desire to emphasize the statement that no apparatus is needed, and whatever artificial appliances for fixation may be added simply tend to increase the discomfort of the patient. Gradually, as the inflammation subsides, the muscles become relaxed and motion returns, provided it is not interfered with by a retentive apparatus, and anchylosis is prevented except in cases of extensive destruction of the joint structures, in which case a cure by anchylosis is the thing to be desired.

The "American idea," as our English friends express it, is to apply a splint which allows mobility with extension. Now, I cannot understand why motion should be desirable in the treatment of inflammation of the hip-joint, when we consider it important to secure immobility in inflammation of all other joints. But the "American idea" goes still further; we must not only have motion with extension, but motion without friction. Now, with all due respect, this seems to me to be a mechanical absurdity; because the tissues covering the joint surfaces are swollen by inflammatory deposits, and the opposing surfaces must rub against each other when moved. We might with equal propriety speak of sound without vibration of the air. Why is it, then, it may be asked, that so much improvement has been reported from the American plan when compared with others not having these features? For my own part, I am in the habit of explaining these favourable results by the fact that the use of instruments devised by American ingenuity has liberated patients from in-door constraint and enabled them to live and move and exercise in the open air, instead of being treated in bed as was formerly done.

To obtain extension of the limb no apparatus is required.

By means of extension we (1) relieve the pain in the part, not by separating the inflamed articular surfaces as has been claimed, for we cannot separate them to an appreciable extent by any amount of extension that can be applied, but the relief comes from subduing the spasm of the muscles which crowd the head of the bone into the inflamed acetabulum; this is the chief cause of the pain that the patient experiences. (2) It corrects the malposition of the limb, whatever it may be, and prevents the deformity which would otherwise occur from contraction of the muscles or partial dislocation of the head of the bone. We all know how promptly spasm of the muscles of the extremities, in cases of cholera or from other causes, is overcome by forcible extension. I have never in any case of hip-joint disease found it necessary to divide contracted muscles, and I believe the only good to be accomplished by it is that in some cases it would enable us to remove the deformity sooner.

To remove the weight of the body from the limb and to adopt some expedient that will allow the patient to get the benefit of open-air exercise, are both so evidently necessary as to require no special consideration.

Fig. 1.
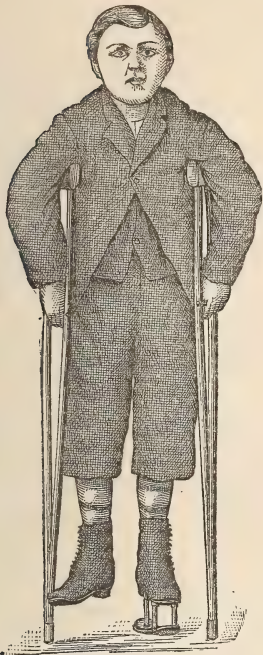
To accomplish the above indication, I have used exclusively for the last eighteen months the mechanical appliances which are shown in the drawing. To the shoe of the sound limb a steel plate corresponding to the sole of the shoe is attached by two or three upright rods, two and a half or three inches in length, so as to raise the foot from the ground; it is the shoe ordinarily used for shortened leg. This elevated shoe and a pair of crutches constitute the apparatus. As the patient stands on his crutches, the diseased limb is suspended. The shoe

Fig. 2.
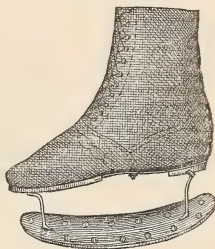
should be high enough to prevent the toes of the affected limb from touching the ground, and the sole should be covered with leather to avoid noise when walking.

By these simple appliances we fulfil all the indications for the mechanical treatment of hip-joint disease. Immobility is obtained and friction prevented in the manner already indicated—chiefly by rigidity of the periarticular muscles; extension made by the weight of the suspended limb, which is greater than the weight ordinarily employed for extension, is quite sufficient to relieve the inflamed parts from pressure and pain, and to overcome the deformity of the limb, even though it be considerable; the weight of the body is removed from the diseased joint, and the patient can enjoy all the benefits of open-air exercise.

It seems to me probable that the method of extension here described is both more efficient and more agreeable to the parts concerned, by reason of being more gradual, equable, less arbitrary and constraining, and therefore exciting a less degree of reflex resistance than most other methods. There is a certain degree of instinctive, unconscious recoil in

the mind of every patient, young or old, against all the various devices of constraint or imprisonment which a splint or apparatus implies.

This plan of treatment should be adopted at once, whatever the stage of the disease, and continued until the cure is completed, except in the comparatively rare form of arthritic coxalgia, where acute inflammation of the synovial membrane and other soft structures of the joint is suddenly developed, attended with great constitutional disturbance and excruciating pain, increased by the slightest movement of the limb or the shaking of the bed. In such cases it would be inappropriate at first. Until after the acute symptoms have subsided they should be treated in bed with the long splint and the weight and pulley, together with other appropriate remedies.

There may be cases in which it will be necessary to make extension at night, by the weight and pulley, to relieve the usual nocturnal pain, while the elevated shoe and crutches are used during the day, but I have not thus far met with any, even among those who had used the night-extension with some portative apparatus during the day, up to the time they came under my treatment.

The patient soon learns that relief from pain is obtained by suspending the diseased limb, and then he is glad to walk or stand on the crutches three or four times daily. This appears to be sufficient to relax the muscles to such a degree that spasmodic contraction with the accompanying pain does not take place at night.

For children who are too young, and older persons who are too feeble to use common crutches, Darrach's wheeled crutch, or the ordinary go-cart, are admirable aids to locomotion. Darrach's crutch is the best, as it is so constructed that the patient may be partially suspended in the crutch, if necessary, by a perineal band which prevents fatigue, and it is also lighter and more elegant in its construction. The elevated shoe should be used with either instrument. If a case comes under treatment at so advanced a stage that resection is necessary, the elevated shoe and crutches should be used after the active symptoms following the operation have subsided, instead of adopting the usual practice of confining the patient to bed and using the weight and pulley.

To illustrate the efficiency of the treatment I have described, I submit a few of the cases that have been subjected to it, mostly from the records of the Orthopædic Dispensary under my supervision.

CASE I. *Morbus Coxarius (second stage), treated by the Elevated Shoe and Crutches; Perfect Recovery.*—Ed. W., aged six years, a well-formed boy with good antecedents, was referred to me by Dr. George W. Baker, of this city. I saw him first July 3d, 1877, and obtained the following history: He fell from a sleigh seven months ago, and struck on his left hip. Soon afterwards he had pain in the hip and knee, growing more severe at night. He had been in bed two weeks, with his thigh and leg flexed, and his mother noticed that whenever the limb was abducted

during sleep, he was instantly awakened by pain. After two weeks in bed, the pain having diminished, he went about the house limping.

When he came under my observation, he had pain in the knee, shooting upward towards the hip, growing much worse at night and when the weather was damp. The limb was abducted and apparently lengthened, the foot everted, the leg slightly flexed upon the thigh, and the thigh upon the trunk, partial obliteration of the gluteo-femoral fold; the periarticular muscles were rigid, so that an attempt to move the joint moved the pelvis with it, as if anchylosis existed at the joint; striking the heel and the trochanter major increased the pain in the joint, and, when laid upon the floor, the effort to bring the popliteal space in contact with it produced a marked curve in the lumbar vertebræ. In short, he presented the symptoms of the second stage of morbus coxarius in a marked degree. He was ordered the elevated shoe and crutches, with open-air exercise and a proper regimen.

At the end of a fortnight the pain had diminished, his aspect had improved, and he bore pressure over the trochanter much better. I saw him from time to time, and noticed a steady improvement.

March 6, 1878. He has had no pain for a long time; all the motions of the joint are as perfect in one leg as in the other, except that the diseased leg cannot be so completely flexed upon the trunk as the well one. As a precautionary measure he was directed to continue the use of the elevated shoe and crutches for the present.

July 4. The treatment was begun one year ago. Two or three weeks since he dispensed with shoe and crutches by my direction. All the motions of the joint are perfect and painless; he walks as well as he ever did; no pain developed on pressure about the hip, slight atrophy of the limb, no deformity; is well nourished, bright, and cheerful, and, as a pugilist, holds his own with any boy of his age in the neighbourhood. I present this case as an example of the best cure of hip-joint disease I have ever seen.

CASE II. *Morbus Coxarius (third stage), treated by the Elevated Shoe and Crutches; Complete Recovery.* Reported by A. R. PAINE, M.D.— Richard V., aged six years, was brought to the Brooklyn Orthopædic Infirmary for treatment, Feb. 12, 1878. His mother stated that about one year ago he fell down stairs, striking on his left hip. Disease in the joint soon followed, for which he was treated by electricity, and wore a modification of Davis's splint. The limb is now adducted, slightly flexed at the hipjoint, and the foot is inverted, resting with the ball upon the opposite instep; the gluteo-femoral fold is obliterated; there is considerable pain in the hip, increased by pressure over the trochanter, great pain in the knee and swelling behind the joint. He is also very anæmic.

Davis's apparatus was discontinued; he was directed to use an elevated shoe, two and three-fourths inches in height, and crutches, and to be in the open air at least three or four hours daily. He was also ordered codliver oil and iron.

March 12. He has been much more comfortable since the elevated shoe and crutches were substituted for the apparatus previously used. His appearance has improved, and he has no pain. His mother has continued to use Davis's apparatus at night, lest the nocturnal pains might return. She was told that it was unnecessary, and directed to discontinue it.

April 5. His general health is very good; no pain even when considerable flexion and rotation are made. His mother left off the night appa-

ratus as directed; says that he has no nocturnal pain, and sleeps as well without the apparatus as he did with it.

Oct. 29. The position of the limb and foot is perfectly normal, no shortening; the joint moves freely in all directions without pain; the most careful examination shows no evidence of disease, and he looks and feels well. He is directed to continue the use of the elevated shoe and crutches for some time longer, as a precautionary measure, although I now consider the case one of perfect recovery. He has been under treatment at the infirmary only eight months.

CASE III. *Morbus Coxarius* (*third stage*); *Marked Improvement by the use of the Elevated Shoe and Crutches.* Reported by A. R. PAINE, M.D.—John M., aged 7 years, came to the Brooklyn Orthopædic Infirmary for treatment Oct. 9th, 1877. Eight months since he was struck on the right hip by the sharp point of a boy's sled while coasting, and soon afterwards had considerable swelling and pain in the injured part. He was treated with liniments by a medical man who did not recognize the disease.

When he presented himself for treatment, he complained of great pain in the hip and knee, especially at night. The thigh was slightly flexed on the trunk, and the leg on the thigh, the limb was adducted and the foot inverted; there was considerable swelling about the hip-joint and gluteal region, with marked tenderness, and deep fluctuation was detected over the posterior part of the joint. The slightest effort to move the joint produced great pain; he had a cachectic look, but no hereditary taint was discoverable. A splint made of hatter's felt was accurately adapted to the hip, extending below the knee for the purpose of fixing the diseased joint, and he was directed to walk with crutches.

Oct. 24. The symptoms continuing, the pain especially being very severe, a shoe, elevated two and a half inches, was to-day put upon the sound foot, and he was directed to continue the use of crutches.

Feb. 5, 1878. His general health has greatly improved; the pain is very much less; swelling in gluteal region more pointed and tender, and there is distinct fluctuation; uses the shoe with great comfort and convenience.

March 25. Aspirated abscess in gluteal region, and removed a small quantity of pus.

May 1. The boy looks and feels well; slight discharge from the abscess; swelling disappeared; no pain either in the hip or knee; position of leg and foot normal; slight motion in the joint without pain.

Oct. 1. His general health, as well as the local disease, has gradually improved until this time. To-day he fell and struck upon the diseased hip injuring himself seriously, and on the 29th of October an abscess, the result of the fall, had formed in the groin, and was discharging freely, but he had no pain, and the position of the foot and leg was normal. The case is still under treatment.

Notwithstanding the unpromising nature of this case, on account of the advanced stage at which it came under treatment, the improvement has been greater than I have observed in any similar case in the same length of time. It was impossible for him to have worn any kind of portative apparatus on the diseased limb, and the only alternative would have been confinement to bed with the weight and pulley to prevent deformity and pain, deprived of the benefits of open air exercise, so important in the

treatment of this class of cases. And despite the grave character the case assumed after the second injury, I think there is great reason to hope that, with the use of the elevated shoe and crutches, without which he could not get out of doors, and with a proper regimen, he will yet recover without resection, and with little or no deformity.

The advantages which the mechanical treatment here described possesses over that commonly employed in the management of hip-joint disease are—

1. It saves the surgeon the trouble and annoyance of applying and carefully watching the instruments in ordinary use, to see that proper extension is kept up and undue pressure prevented, while the patient's comfort is greatly promoted by dispensing with adhesive plasters which irritate the skin and require removal from time to time, and also with the perineal band, which is a constant source of discomfort.

2. The spasmodic contraction of the peri-articular muscles is overcome by the gentle, persuasive, and painless (physiological) extension made by the weight of the limb for several hours each day, whilst forcible extension, either by the ordinary portative instruments, or by the weight and pulley, irritates the muscles and stimulates them to resistance and contraction, which must be overcome by main force.

3. I am quite confident, judging from the experience thus far obtained, that the plan of managing coxalgia herein described, will shorten its duration more decidedly than can be done by the older methods of treatment.

4. The apparatus (if so simple a thing deserves the name of apparatus) is inexpensive, and can be made by any ordinary mechanic.

I may add, in conclusion, that I hope at some future time to publish my experience with the method of extension here described in the treatment of inflammation of the knee and ankle-joints, to which it is quite as applicable as to diseases of the hip-joint.

Article V.

LATE HEREDITARY SYPHILIS.[1] By I. EDMONSON ATKINSON, M.D., Physician to the Baltimore Special Dispensary.

M. B., white, sixteen years old, and born in Baltimore, was brought to my office by my friend, Dr. Samuel Theobald, to whom she had applied for treatment for her eyes May 27, 1878. She is of medium height, of slender frame, and well proportioned. Her complexion is fair, eyes blue, and hair light in colour. Her parents are both living, and she has a brother and sister, the former four years older, the latter two years younger than herself. She menstruated for the first time last fall, and

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[1] Read before the Baltimore Clinical Society, Nov. 1, 1878.

has been regular ever since. Until her ninth year she was rather delicate, but thinks her health was moderately good (as also does her mother, who accompanied her). Her most severe illness up to that time was an attack of measles during her seventh year. During her ninth year she was first troubled with sore throat, which became so severe that she was obliged to leave school. For this she was treated by a physician, who applied caustics to her throat, and used other remedies. In spite of this, however, it was only after several years that this trouble yielded. Somewhat more than two years ago, she had soreness and ulceration of the roof of her mouth, and at this time some small pieces of bone were discharged from her mouth, and came, as she says, from her hard palate. She does not know when this got well. Two years ago a pimple appeared upon the left side of the upper lip, just under the ala of the nose. At the end of two weeks, and when no larger than a split pea and covered with a scab, this was cauterized by her physician. After this, ulceration proceeded with great rapidity, and extended towards the left ala nasi, which soon became invaded, as likewise the nasal septum. The tip of the nose was next involved, and in a short time the ulcer covered the other side of the nose and both cheeks. During this time the disease spread continuously, and no new foci of ulceration were developed. As well as she can recollect, at no time have there been papules or tubercles around the edges of the ulceration. At the end of a year the nasal septum had been entirely destroyed, and small pieces of bone were discharged from the nasal cavity. Cicatrization had begun previous to last summer, and before the autumn was complete over the nose and left cheek. While cicatrization was occurring in these parts, there was steady but irregular extension of the ulceration in other parts of the face. During the past winter the lids of both eyes became involved, and the forehead has been invaded only during the past few weeks. Many remedies have been employed, all, she thinks, without benefit, except the white precipitate ointment, which she has been using since last fall at the instance of a friend.

Her present condition is as follows, viz., the entire face from just in front of both ears, extending superiorly to the lower half of the forehead and inferiorly to a point below the chin, is occupied by a circular surface, made up of areas of ulceration and of scar tissue, the latter covering the cheeks and nose, and forming more or less irregular bands and rugosities. The nasal bones preserve to a great extent the normal shape of the upper portion of the nose, but the alæ are almost completely flattened to the level of the cheeks; the nostrils have been replaced by two very minute holes, hardly large enough to admit pin heads, and almost useless in the respiratory act. The mouth is distorted, and its orifice narrowed. To the right of the chin is an ulcerating surface, said to be of about six months' duration; this surface is bounded externally very sharply from the healthy skin by a ridge of granulating tissue. The ulcer itself is red and granulating, but little excavated, and discharging a small amount of thin pus. Several ulcers are here grouped together; the largest one is of irregular outline, and five cm. in diameter; near this are several small oval ulcers. The eyes, which became affected early last winter, the right one first, present a really hideous appearance. The upper and lower lids of both eyes have been extensively destroyed by the ulceration, so that neither eyeball can be covered perfectly. The lids are much thickened, their edges are red, glazed, and raw; the lashes are for the most part absent. The conjunctivæ are swollen and inflamed. Both corneæ are

cloudy, and upon the right one is a small ulcer. The orifices of the lachrymal canals have been obliterated, and the tears trickle over the cheeks.

Upon the forehead, arranged in a semicircle, just above the nose, are four small ulcers, the lowest one as large as a split pea, red, granular, and excavated, the others causing a slight prominence of the skin, and quite small. These are separated by areas of healthy skin, and have appeared only within the month. Outside of the well-defined margin of cicatricial tissue upon the cheeks, there are no morbid conditions; the same may be said of the ulcers near the chin. Nowhere are there papules or tubercles present. There is some enlargement of the submaxillary glands, which sometimes become tender, but have never suppurated.

Examination of the buccal cavity shows cicatricial tissue extending over the hard palate, which is deeply arched. Just behind the upper middle incisors is a deep pit in the bone, which is now imperforate, but is doubtless the site of the old loss of substance. Proceeding backwards towards the pharynx, cicatricial bands are everywhere visible. The uvula has been entirely destroyed, and the anterior pillars are adherent to the posterior wall of the pharynx. At present there is no ulceration in these parts. The central upper incisor teeth are perfect, but there is some irregularity in the arrangement of the other incisors. None of the teeth are peg-shaped. The conformation of the head is not suggestive of abnormal conditions. Ulceration has destroyed all other specific modifications of the physiognomy, if, indeed, any ever existed.

The general health of the patient is now pretty good; and her mother says that with the exception of the attack of measles she has had no other cutaneous eruptions than those noted; neither have there been periosteal thickenings, or rheumatoid pains, nor are there other scars of lesions upon other parts of her body. Her urine is free from albumen and tube casts.

Her mother has never miscarried, and has two other children—a son four years older than my patient, who is said to be perfectly healthy, and a daughter fourteen years old, whom I have seen, and who is apparently perfectly healthy. The mother, however, has around her mouth several circular scars, which she attributes to sores many years ago. The father is subject to an eruption upon his face, which has been called erysipelas, but which gives rise to scars, and which he has had ever since he was in the army during the late war. While in the army he had an extensive ulceration upon his shoulder. He has suffered much from " rheumatism," and is always ailing and unable to work. (The information concerning the husband and father was obtained from his wife and mother; the man himself has persistently evaded me, and has avoided an examination.) There can be but little doubt, then, that the girl's father was already during the war the victim of somewhat advanced syphilis.

From the statements of the patient and her mother, it seems probable that her lesions had been treated by her physicians as manifestations of lupus; at all events, there was no history of the administration of mercury or of iodine; but, upon the other hand, frequent cauterizations had been employed. (It will be remembered that the white precipitate ointment, which had been used for some months, had been recommended by a nonprofessional person.) There could, evidently, be here only the question of syphilis or of lupus in the formation of a diagnosis. From the fore-

going description it will be at once remarked that the lesions presented were strongly suggestive of lupus ; the superficiality of the ulceration, its red and but slightly secreting surface, more closely resemble lupus than syphilis.

Upon the other hand, there was the history of a very much more rapid ulceration than is observable in lupus, the face being almost entirely invaded within two years after the appearance of the tubercle upon the upper lip ; again, the cutaneous ulceration was preceded by a pharyngeal ulceration, which had begun five years previously, a pathological succession not observed in lupus, since the lupous affections of the mouth and fauces are only met with "in association with cutaneous lupus, either as a direct continuation from the skin of the cheeks and lips, or independently." (Kaposi, Hebra, Dis. of Skin, New Sydenham Society's Translation, vol. iv. p. 70.) Another important point of difference was the destruction of bony tissue in this young woman, both of the hard palate and of the nasal cavity. Destruction of bone is certainly a rare occurrence in lupus. Kaposi does not recollect to have seen " secondary inflammation of the submucous tissue ending in caries or necrosis of the bones of the hard palate, and perforation extending through into the cavity of the nose, nor necrosis of the vomer in consequence of lupus of the mucous membrane of the nose."

There was, furthermore, the history of suspicious ulcers upon the mother's face, and the clear history of symptoms in the father, dating back many years, and almost without doubt due to syphilis.

Actuated by these considerations, I formed a diagnosis of syphilitic ulceration ; and in view of the early age at which symptoms, usually held to be late manifestations of the disease, exhibited themselves ; the absence of other symptoms of the earlier stages ; the modified character of the lesions observed, contrasting markedly with the ulceration of the same parts in the acquired disease ; and the probably late stage of the disease in the father about the time of her birth, I concluded that these lesions derived their origin from an inherited taint. The correctness of this conclusion will, I think, presently appear.

Acting, then, upon this diagnosis, treatment of an antisyphilitic nature was immediately begun. The white precipitate ointment was ordered to be continued as a local application, and there was ordered a mixture containing 8 grains of potassium iodide with 20 minims of the syrup of the iodide of iron in a tablespoonful of water three times daily. After a week the dose of the iodide was increased to 15 grains, and after this no change in treatment was made until an entire cure had been effected. By June 24th the ulcers upon the forehead were entirely healed, and during the first week in July those upon the lower parts of the face were well. The eyes were much better, although the swelling and loss of substance rendered it impossible to completely close the lids. After this time, considering herself well, she became irregular in her attendance ; but when last seen the left eye was very much better, and could be closed by a determined effort ; the right eye still remained inflamed with excoriated, thick-

ened lids, not sufficient to cover the eyeball.   She was ordered to continue
her medicine.

Here, then, was a case where the face was converted into a repulsive
scar; where a young woman of sixteen years will be condemned, during
the rest of her life, to hide her countenance from her fellow creatures;
where a happy future has been rendered absolutely impossible by a malady,
whose early recognition would almost certainly have resulted in a prompt
and complete arrest, and in the preservation of her features in their in-
tegrity.   Here, also, the characters of the symptoms might have indicated
the nature of the disease, or at least have suggested that *experimentum
crucis*, an antisyphilitic treatment.

Under these circumstances it may be worth while to draw attention to
some peculiarities of that form of hereditary syphilis denominated "tardy,"
more especially to the tendency of the disease in this stage to attack the
pharynx and fauces, the bones of the hard palate and nasal cavity and the
contiguous parts.   It is a disputed question whether syphilis *hereditaria
tarda* may appear without the patient ever having had, during infancy,
any evidences of the disease; whether, in a word, hereditary syphilis may
appear for the first time after the period of infancy.   There are distin-
guished authorities who believe that such may be the case.   Van Buren
and Keyes, *Genito-Urinary Diseases with Syphilis*, page 662, say,
"That there may have been some undiscovered symptom in babyhood
may be allowed, but still it is as near a certainty as possible, without
absolute proof, that a child of a parent whose syphilis has nearly run out,
may show no signs of disease until many years after birth, and then the
lesion will be of a bone, a joint, a gland, the eye, or perhaps there will be
a patch on the mucous membrane of the buccal cavity, an ulcer of the
nose resembling lupus, or some other single localized lesion usually passing
undiagnosticated as far as its etiology is concerned."   On the other hand,
A. Weil (Ueber den gegenwärtigen Stand der Lehre, von der Verebung
der Syphilis: *Sammlung Klinischer Vorträge*, etc.) declares that the
occurrence of inherited syphilis manifesting itself for the first time after
years, or at the time of puberty, is just as questionable as the occurrence
of tertiary symptoms in acquired syphilis without the previous manifesta-
tion of the primary affection, or of that of the secondary period.

Although the literature of late hereditary syphilis is scanty, and the
relations of the affection but imperfectly known, there are a number of
cases recorded where as far as was discoverable the first symptoms were
observed after puberty.   Baümler, Weil, and others, however, doubting
the possibility of this, call attention to the, occasionally, very insignificant
manifestations of infantile hereditary syphilis, and to the great probability
of their being overlooked.   Naturally, an insignificant lesion is most apt
to pass unnoticed or to be forgotten; and the most that can be said at the
present time is that *late hereditary syphilis, even of very grave character,*

*may occur in individuals, who, during infancy, suffered from symptoms
of their inherited disease, so mild and unimportant as to escape recogni-
tion.*

The symptoms of late inherited syphilis usually resemble those of a
modified tertiary form of the acquired disease, but have also, undoubtedly,
been treated of by many writers, as manifestations of the scrofulous dia-
thesis. It is, however, the opinion of writers of the most experience, that
the differences between late hereditary syphilis and scrofula are positive.
Hutchinson, for instance, asserts without hesitation that hereditary syphi-
lis "neither predisposes to consumption nor to the ordinary forms of scrofu-
lous and tubercular disease."

It is, however, not my intention to speak of the various lesions of the
stage of the disease under discussion, but merely to draw attention to a set
of symptoms whose actual presence, or the cicatricial remains of whose
former presence in children and young persons not known to be syphilitic,
should always arouse the suspicious watchfulness of the medical man.
There are usually evidences of past or present disease which are well
known, to betray the syphilitic inheritance of certain persons; there may
be the peculiar notched upper central permanent incisor teeth, the inter-
stitial keratitis or its vestiges, the flattened bridge of the nose, the linear
cicatrices about the mouth, the protuberant forehead. There is also
usually the history of syphilis in infancy. All these sources of information
may, however, be absent, and we may be obliged to look for other signs
to throw light upon our perplexities. When, therefore, a patient who has
never had acquired syphilis presents destructive lesions, or their remains, of
the pharynx and fauces, of the hard and soft palates, or of the nasal cav-
ity, the probability that he has to do with inherited syphilis should sug-
gest itself to the medical attendant.

A review of the recorded cases of late hereditary syphilis reveals an as-
tonishingly large proportion of lesions of the character just referred to.
Lancereaux (*Traité Historique et Pratique de la Syphilis*, Paris, 1873, p.
436), in quoting cases of hereditary syphilis of late development reported
by various authors, such as Balling, Trousseau, Fournier, Sperino, Sig-
mund, Ricord, Bouchut, and others, records a large majority in whom the
destructive lesions or their scars implicated the pharynx, the hard and soft
palate, and nasal bones. Several of these cases likewise presented destruc-
tive ulceration of the face. Cases have also been reported by Laschkewitz
(*Vierteljahr. für Dermatologie und Syphilis*, Heft. 2. 1878), Klink (quoted
in the same Journal), Zeissl (*Pest. Med. Pr.*, Jan. 1877), Wilks (*Lancet*,
Feb. 19, 1876), Lewin (*Wien. Med. Presse*, No. 1. 1876), and others.
In a paper read before the Société Nationale de Médecine de Lyon (*Lyon
Médicale*, July 16, 1876), M. Dron related fifteen cases of late hereditary
syphilis in whom naso-pharyngeal symptoms were the lesions most com-
monly encountered. Lancereaux declares that he finds himself more and

more disposed to consider those affections described under the name angina scrofulosa, purely tardy manifestations of hereditary syphilis. Chaboux (*Certain Lesions of the Naso-pharyngeal Region which should be attributed to Syphilis*, Thèse de Paris, 1875) "concludes that late tertiary syphilis, particularly the hereditary forms in children and adults, is far more common than is generally supposed; that the naso-pharyngeal region is its site of election; that suppurative osteitis of the nasal and palatine bones, with ulceration of the velum, isthmus, and pharynx, as well as certain forms of tubercular lupus, limited to the alæ nasi and septum, should not too hastily be attributed to struma" (*Archives of Dermatology*, April, 1878).

Van Buren and Keyes (*Genito-Urinary Diseases and Syphilis*, page 599) remark, "It has been written that scrofula may cause these throat ravages in children ; because children are found in whom a syphilitic history or parentage cannot be traced, who have ulcers and other evidences of so-called scrofula and destructive ulceration of the soft palate, perhaps, not so promptly relievable by the iodide of potash as similar fresh conditions in the adult. Yet the iodide of potassium is usually given for these cases, and with benefit."

Zeissl, who believes that in these cases of late hereditary syphilis, the taint is derived from the father, in whom the symptoms of the disease were latent at the time of impregnation, says that the children may be born and remain during their years of infancy apparently healthy, but that gradual gummous infiltrations appear upon the skin (lupus. syph. hered.), with accompanying destruction of the soft palate and of the nose (ozæna syph.), enlargement of the bones, etc., appearances which, in former times more frequently than at present, were considered manifestations of scrofula (*Lehrbuch der Syphilis*, 1871, p. 304).

It seems quite certain then that there is a special predisposition towards ulcerative lesions of the pharynx and soft palate, and of the bones of the hard palate and nasal cavity, in persons suffering under the taint of hereditary syphilis ; and the practical conclusion to be drawn from this circumstance is, that in all cases involving lesions of these parts where the question of acquired syphilis may be excluded, and even where other signs of inherited syphilis may be wanting, the employment of antisyphilitic treatment should not be held in reserve as a last resort, but, on the contrary, its prompt and vigorous exhibition should be immediately decided upon and persistently continued, in the strong hope that by so doing, such repulsive deformities as have occurred in my case may be averted, and the patient quickly relieved of an almost interminable source of suffering and mortification.

This treatment may with all the more confidence be resorted to where destructive lesions of the mucous membrane of the parts under discussion have occurred without or previous to cutaneous lesions, and where losses

of bony substance have taken place in the palatal and nasal regions ; since lupus, the affection offering the strongest resemblance to the effects of syphilis upon these parts, is only met with in these localities, in association with cutaneous lupus, either as a direct continuation from the skin or independently, and since destruction of osseous tissue by lupus is, to say the least, exceedingly uncommon.

BALTIMORE, 223 Madison Avenue.

ARTICLE VI.

EXCISION OF A LARGE FEMORAL CYST ; GENETIC ORIGIN OF SUCH CYSTS FROM CONGENITAL PERITONEAL POUCHES. By MIDDLETON MICHEL, M. D., Prof. of Physiology and Histology in the Medical College of the State of South Carolina, Charleston.

THIS report of a cyst of the thigh of considerable size, which came under my care some years ago, with another exactly similar recently under my observation in the practice of a colleague, is of surgical interest, since there are but few of like character on record. As my special object, however, is to furnish an explanation of the possible origin of these growths, which it appears is involved in such obscurity as to be passed over without reference, or attempted to be accounted for by the vaguest hypotheses, I shall make their probable mode of development the principal topic of remark, without intruding a dissertation on the pathology of cystgenesis, with a tiresome repetition of particulars that are perfectly well understood.

CASE I.—A negro man, aged fifty years, a servant of Mrs. Charlotte K., of this city, came under my professional care many years ago. He presented a cystic tumour of great size, occupying the entire inner portion of the right thigh from below Poupart's ligament to within a few inches of the knee-joint. In circumference the tumour measured around the thigh in its greatest transverse direction about thirty inches, was almost spherical in shape, and presented fluctuation.

It had never been tapped, and had grown slowly from a tumour of the size of a walnut to its then inordinate dimensions. Giving no pain, this tumour became the subject of complaint only when through its size free locomotion was impaired. He was operated upon in the amphitheatre of the medical college in presence of the class. An extensive incision was required which was practised in a longitudinal direction almost parallel to the course of the femoral artery along the inner border of the cyst from Poupart's ligament to within the neighbourhood of the knee-joint.

The isolation of the cyst at its inner, anterior, and outer portions, though requiring careful dissection not to perforate the sac, was easily accomplished ; but its adherence at its under part was so intimate with the deeper tissues and sheaths of the vessels and nerves as to constitute the most difficult, perhaps dangerous part of the operation, as it certainly was the most protracted part of the procedure. It rested upon and dipped deeply

between the adductors, and when raised from its bed presented a sort of pedicle, which descended, to all appearance, far into the pelvis. It was at this juncture, while dragging upon the pedicle to discover its connections and directions, that the sac was accidentally opened and a large quantity of dirty serum escaped. The cyst was cut away, no ligature was used around the pedicle, and but few vessels required ligaturing. The finger penetrated to some depth at the site of the pedicle, but revealed nothing. The wound of necessity was very considerable, at the bottom of which the femoral vessels and nerves were seen dissected from the growth throughout their extent. The parts were brought together by sutures, and the proper provision made for drainage. Though sustained by nourishing food, and every care shown him in the ward of the Roper Hospital assigned to such cases as were made the subject of a surgical clinic to the medical class, yet the wound exhibited no disposition to heal by first intention, suppuration was excessive from all parts of the extensive track, welling up especially from the deepest part just beneath the pelvis. Exhausted by the reactionary fever, suppuration, and perhaps shock of the operation, the patient succumbed in fifteen days. No necropsy was made, which I have had occasion to regret ever since.

Unacquainted with any similar cystic growth in this particular situation, I consulted the famous thesis of M. Pardieu, published in 1839, and found that Velpeau, in his unparalleled experience, was credited with two cases of the kind—one of the anterior, another of the exterior part of the thigh; but with no accompanying details nor reference to where such might be found. The first descriptive account of a very similar case to my own came to my notice, not until several years after this operation; this was a large cystic tumour of the thigh, in a boy of fourteen, admitted into University College Hospital February 24, 1856, under Erichsen's care, and published in the *Lancet* for August, 1856. The particulars, so far as they concern this subject, I will here give.

CASE II.—The tumour grew to a great size from a small cyst at the upper and inner part of left thigh in eighteen months; it was tapped and speedily filled again, was injected with tincture of iodine. The boy attributed the rapid growth of this cyst to its present size to friction of the inner aspect of the thigh against the saddle in riding; he suffered no pain. In shape, oval; the cyst extended up to Poupart's ligament as far as the adductor muscles permitted, beneath which it was in part buried, bulging out posteriorly until it appeared as "an enormous additional buttock," situated below the natural one. Standing up, the maximum circumference of the tumour was twenty-five inches—the opposite thigh, on the same level, was seventeen inches. M. Erichsen made an incision seven inches and a half in length along the inner aspect of the thigh, commencing just below the ramus of the pubes. A prolonged dissection separated this growth from its intimate attachments and muscular fibres which reinforced the several layers of thickened fascia by which it was surrounded. "Superiorly, the walls were firmly adherent to the surrounding parts, and blended with them. The cyst was now cut open, and the fluid evacuated. Room being obtained for the introduction of the finger, the cyst was found to run up under the adductor brevis to the pelvis, the ramus of the pubes and the borders of the thyroid foramen being distinctly felt from the inside of the sac. All the walls of the cyst which could be dissected from the surrounding parts were now cut away, and what remained firmly adherent to the muscles was rubbed with caustic potash." This patient died on the second day, and at the *post mortem* "it was found that the cyst lay between the adductor magnus behind, and the adductors longus and brevis and the pectineus in

front.   Superiorly it extended up in front of the quadratus lumborum'' (femoris ?) '' and the obturator externus.   What remained of the cyst was firmly incorporated and joined with the adductors magnus and brevis; the substance of the former is very much indurated, and the cellular tissue amongst the fibres very much hyper-trophied.''

It was not again until very recently that I met with another cyst growth in precisely the same position, in the colored ward of the Roper Hospital.

CASE III.—Robert Hicks, a negro boy of about twenty years old, was admitted into the Roper Hospital, May 20, 1876, with a large cyst occu-pying the right thigh extending from below Poupart's ligament to the middle and inner part of the thigh.   It gave no pain, was movable beneath the skin, though firmly adherent at its base, which rested upon the femoral vessels.   It had grown in a few years to its present large dimensions, and giving inconvenience during the exercise of the limb, while its cystic cha-racter was clearly established, it was determined to remove it by excision. This was done a short time after his admission by Dr. Porcher, through an incision of sufficient length to admit of a free and careful dissection being made, which liberated the cyst from all adjacent parts except again a well-marked pedicle which retained the growth in deep relation with the intermuscular spaces leading beneath the horizontal branch of the pubis towards the sub-pubic or thyroid region.   So conspicuously deep did this pedicle run, that it was thought advisable to ligate this part of the cyst before cutting it away.   The wound, being sutured, was dressed in the ordinary way, but showing no tendency to heal, injections were made with the permanganate of potash, anodynes and tonics administered, under which treatment some progress was made towards recovery, when he asked for his discharge and left the hospital July 7th, not quite two months after his admission.   We learn that he died shortly after this.

Though constantly repeated that cysts may occur in any part of the body, the extreme rarity of their appearance in the thigh is evident from the few cases which seem to be recorded.   Mr. Erichsen, in his clinical remarks, observed that he was familiar with a case of the kind in the practice of an eminent surgeon of London,[1] in which a great portion of the cyst was removed and the remainder allowed to suppurate away ; and that Mr. Paget had referred to two cases in his work on tumours; one in a woman of twenty-five, which was removed easily, though adherent by a small portion to the front of the pubes ; and another in a woman of fifty years, where Mr. Lawrence removed a tumour in an exactly similar part, and both operations were successful.   We have already alluded to the two cases belonging to Velpeau; these with Mr. Erichsen's, mine, and Porch-er's, make in all eight cystic growths developed in this peculiar manner in this region, with a history, so far as we have been able to obtain any information, strikingly similar.

The problem of origin of this particular kind of cysts has specially occupied my thoughts ever since the first case came within my observa-tion years ago, and the object of detailing my own case now, associated

[1] Lancet, Aug. 1856, p. 215.   New York edition.

with that of others of a like kind, has been to account for their development upon anatomical grounds, which, if as correct as apparently plausible, must remove at least this class of cases from the list of cysts of *spontaneous, accidental* as Perdieu terms them, or *independent* origin according to Green, in which they are included by all authors. Opinions expressed by pathologists on this subject of origin are purely hypothetical, as they appear to rest upon no accredited example of cystgenesis by the methods proposed. Theories vary accordingly with each writer, and some are of the most imaginative character: for instance, it has been conjectured that a vein may become obliterated at some one point, distension then follows upon the distal side until a sac or cyst is formed, absorption of the contents slowly progresses until nothing but colourless serum remains to fill the thus formed cyst; or transformation is supposed to occur in some vascular tumour, which of course must pre-exist, must precede the formation of the cyst, thus some hystolytic change takes place within a *nævus*, which in turn degenerates into a cyst; a yet more commonly received opinion, which is demonstrable and therefore undoubtedly true as to the production of small cysts, but scarcely applicable to the class of cysts we are describing, is that a sudden extravasation of blood takes place into a part, filling no very great space, which soon must clot, the fibrin at the peripheral portion of the clot *fibrillates*, presents a felt-like appearance, assumes organization, which is the more readily accomplished the smaller the clot, and the closer the peripheral parts to organized and healthy tissues, this organized film of fibrin, traversed by bloodvessels, promptly acquires structure, and thus constitutes an enveloping membrane, which in time becomes the future cyst wall; it has even again been affirmed that adipose tissue itself in intermuscular spaces may under peculiar conditions soften down or liquefy, become absorbed, leaving empty areolar tissue whose intercommunicating cells merge into one vast cyst-like sac, which as it fills with its own secretions presses upon and condenses the connective tissue around it until a firmer sac is formed. This expansion and fusion of spaces in connective tissue has been invoked to explain a number of smaller bursæ and serous cysts forming in all parts of the body.

Another method of accounting for certain congenital indurated muscular tumours, seen occasionally in the sterno-mastoid muscle, supposed sometimes to degenerate into cystoid growths within the belly of the muscle, was proposed by Mr. Thomas Smith in 1870.[1] The suggestion is made that the fibres of the affected muscle are accidentally ruptured, effusion of blood within the muscular sheath takes place, room for which is made by the retraction of the torn fibres. Here, the clot must undergo the changes which I above described, therefore a cyst thus formed does not differ in origin from one produced by extravasation.

[1] Transactions of the Clinical Society of London, vol. iv., 1871.

It may again be said that the general drift of modern hystogeny, from which more reliable because more scientific information is obtained, ascribes these growths, whether solid or cystic, to that all-important factor in most morbid productions—the migratory mobile leucocyte, amœboid, nomadic, or wandering connective-tissue cell; a plausible theory of pathogenesis, which derives all development from pre-existing cellular elements as the fundamental law of hystogeny; since all evolution, whether normal or pathological from a cystoblastema or plastic blastema derived directly from the blood with *free* cell birth, after the Schwannian method of exogenous growth, is unverified and now an exploded theory, notwithstanding such able adherents as a Pouchet or Broca, a Bennett or Bastian. To this, without discussion, let me emphatically state that no one has ever as yet seen, however bright a future may await the theory, a cystoma, fibroma, carcinoma, lipoma, osteoma, or any neoplastic birth spring from either the wandering cell or the yet more stable connective-tissue corpuscle.

Dissentient critics of these unsatisfactory thories have not always substituted less conjectural explanations of the origin of the independent cyst. M. Birkett[1] of Guy's Hospital, for example, in an able paper on the Surgical Pathology of the Sero-sanguinous Cysts in Neck and Axilla, of which he had seen only three, rejects Mr. Paget's doctrine of their origin, yet substitutes for all such hypotheses, his statement : "That this cystiform growth should be regarded as a peculiar development of its own kind and individuality." Some of these speculations, however, we cannot properly reject, so far as they relate to the development of other kinds of cysts, for the progressive steps of growth, in many of these instances, may be actually followed, where, for example, a sebaceous cyst springs from obliteration of a duct, or a sanguineous effusion consequent upon some injury or blow becomes encysted. A cystoma of truly independent origin, bearing no relative affiliation with surrounding tissues, wedded in no respect to neighbouring parts by natural ties of structural identity, would exhibit the development of an outgrowth towards the surface, would scarcely be found to plunge by a deep pedicle towards, perhaps into, the pelvis, and such isolated growths could be cut, scraped, burnt, or injected with very little danger to life ; whereas, the kind of cysts we are here describing have all had a prolongation springing significantly from the deepest part of the thigh, and have proved conspicuously dangerous upon being cut, whether the pedicle were tied or left opened, since death has followed in three or four instances. Accidental or independent cysts I am also inclined to think are somewhat limited in size, scarcely if ever attaining the dimensions of such as take birth in some normal vesicle or sac, such as a Graafian follicle which grows without restriction until it acquires the unlimited capacity of an ovarian tumour.

[1] Am. Journ. Med. Sci., April, 1869, p. 468.

Thus it occurred to me, with respect to these growths within the thigh possessing their own cell-wall, lined with epithelium, and presenting a prolongation always directed towards the pelvic cavity, to look for a less remote origin—for one that might be connected with some pre-existing structure, and this, it now appears to me, is to be found in those peritoneal pouches or vaginant folds of peritoneum which Roser, Linhart, and Engel made the subject of anatomical study years ago; which we have elsewhere argued played an important part in the production of hernia,[1] but which have never before been invoked to explain or account for the development of these peculiar femoral cysts.

Now these peritoneal pouches are most common in the inguinal region, but are by no means confined to this locality; associated with defective development of the tendinous fibres about the pelvis, these peritoneal canals may protrude in various directions in and about the thigh, and are the forerunners of hernia in these several directions, though scarcely discoverable until the intestine, or some other organ, as the spleen, kindney, uterus, ovary, or even bladder, by descending reveals the congenital opening. The development of such a pouch or sac need not depend, however, upon any herniated organ; lined by epithelium, and being a part of a vast abdominal serous membrane, the accumulation and retention of serous exhalations at first, and finally of a more abundant serous secretion, would of themselves, under certain circumstances, unfold its saccular character, and in due time the whole growth would undergo such textural changes as are known to occur in every hernial sac, that is to say, the sac would expand, not by borrowing tissue from the adherent abdominal parietal layer of peritoneum, but as an actual extension of the area of the sac itself, associated with progressive thickening of its own structure, so that what was at first no larger than an inguinal gland would gradually enlarge, like an ovarian cyst, to a considerable size. The very thickening of the walls of such a sac, and subsequent progress of growth, insure certain alterations in the funicular portion as will form the neck or pedicle. Augmentation and outgrowth of the sac elongates and puts this funicular portion upon the stretch, until it becomes more or less constricted and corrugated, while at the same time it shares in the general thickening of the entire structure, and in its narrowed precincts by condensation of tissue becomes finally obliterated, cutting off all communication with the peritoneal membrane; all of which is more likely to occur under the continued friction to which the parts are subjected during locomotion, or more especially from any blow or injury.

Without any great effort of imagination, we can easily understand how a cyst is gradually formed just where anatomy shows these congenital serous prolongations to exist, for there can be but little doubt that in some

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[1] Charleston Med. Journ. and Rev., Jan. 1876, p. 263, Oct. 1876, p. 182.

such way cysts about the neighbourhood of the testicle are produced; as scrotal cysts, from the *peritoneo-vaginal*, *epididymal* and *testicular* diverticula of the tunica vaginalis.

A cyst thus originating may be found, therefore, isolated completely among the muscles, or perhaps revealing its primitive origin solely by a pedicle dipping deeply down to some one of the openings about the pelvis.

That these peculiar cysts, discovered to be invariably connected with some of the pelvic outlets, originate in one of those vaginal duplications of the peritoneum, which research has shown are frequent in infancy and often through adult life, as congenital embryonal structures, similar to the peritoneal canals in some of the lower animals, seems far more reasonable than to ascribe their source to some wandering leucocyte or connective tissue corpuscle.

These structural points connected with the history of the peritoneum are little known at best, perhaps even to those who most have cultivated the diligently reaped, exhausted field of anatomy, and are therefore of the deepest interest to the comparative anatomist and embryologist; but we have only so far referred to the subject as was immediately connected with the generation of these cysts, so persuaded, so convinced are we of the dependence of these pathological conditions one upon the other, a fact too significantly reiterated in the frequent, we may almost say constant, connection of these cysts with a pelvic pedicle of some sort.[1]

This subject may have already detained some readers too long, though of particular interest to ourselves, believing, as already intimated, that this is the first time that these congenital peritoneal canals of rare occurrence have been thought of in connection direct with the development and true genetic origin of pedunculated femoral cysts.

In conclusion then, at the risk of monotonous iteration, we would enforce our own convictions upon the true student of surgical pathology, that, through his subsequent researches, he may disprove or prove us correct: *that these large femoral cysts, whether pedunculated or isolated, spring from rare congenital funicular or vaginant processes of peritoneum.*

CHARLESTON, S. C., Sept. 30, 1878.

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[1] Mr. Paget's two cases of cysts, already referred to, may probably be the same mentioned in his catalogue of the pathological collection in the Museum of the Royal College of Surgeons of England, and if so, it is stated that these large cysts "filled up the thyroid hole, projecting both into the pelvis and the thigh."—*Chelius's Surgery*, vol. iii. p. 432, Philadelphia, 1847.

<center>Article VII.</center>

Asthmatos ciliaris.—Is it a Parasite, the cause of Catarrhal Affections? By Joseph Leidy, M.D., Professor of Anatomy in the University of Pennsylvania.

In the number of the *Virginia Medical Monthly*, for November, 1878, the leading article is entitled " Rhizopods (Asthmatos ciliaris) a Cause of Disease. By Ephraim Cutter, M.D., Boston." According to this communication there exists a parasitic animal, which is the ordinary cause of influenzas, catarrh, hay fever, and the like affections. The discovery of the parasite and its agency in disease are attributed to Dr. J. H. Salisbury, who published a paper on the subject in Hallier's *Zeitschrift*, Jena, 1873. From the original account it would appear that a peculiar animalcule, the *Asthmatos ciliaris*, is the cause of " infusorial catarrh and asthma." The parasite is stated to assume a great variety of shapes and sizes during the different phases of its existence. Descriptions accompanied with figures are given of many of its varieties of form. Its mode of reproduction is described, and it is asserted that from time to time the *Asthmatos* gives birth to living young.

Afterwards follows a description of the catarrhal affection induced by the parasite. In reference to the season of its invasion, Dr. Salisbury remarks, that " when it occurs during the latter part of the summer and early autumn, it is usually called 'hay fever' or 'hay asthma.' " The author regards the affection as contagious. In speaking of the treatment, he says that " the only remedies that do any good are such as either destroy or retard the growth or reproduction of the parasite."

The observations of Dr. Salisbury are confirmed by those of Dr. Cutter, who gives his experience of cases of the disease, and the results of his examinations of the supposed parasites. In some of his researches he was assisted by Prof. Paulus F. Reinsch, of Erlangen, Germany, an able microscopist, who also made drawings of the *Asthmatos*, which accompany the communication. Dr. Cutter defines the position of the *Asthmatos* in the zoological series, and refers it to the class of Rhizopods with close affinity to the sun animalcules or Actinophryans.

In conclusion Dr. Cutter remarks " that there is a parasitic animal found in the secretions of the respiratory tract of persons suffering from influenza, colds, catarrhs, and asthmas." Dr. Salisbury, the discoverer, has observed over 1000 cases ; Mr. Daykin reports a case ; Dr. Reinsch, two cases in one individual ; and the writer has observed about 100 cases." Dr. Cutter adds that " it is supposed to be the cause of the disease named because it is infectious ; parasiticides kill it ; with its death comes instant relief to the symptoms of the disease ; and when carefully looked for, it is found to exist in this class of cases and not in other catarrhs."

The number of the *Virginia Medical Monthly* containing the communication of which the above is a brief notice, came to me while I was actually affected with a catarrh akin to hay fever, similar attacks of which I have had, sometimes during the autumnal season, for many years. Dr. Cutter appeals to the present writer as to the true position of *Asthmatos ciliaris* in the zoological system. From the descriptions and drawings, its characters would assign it to the class of Infusoria and order Ciliata, rather than to the class of Rhizopoda. If it were a distinct animal, according to the classification of Stein, it would be a peritrichous ciliate infusorian.

Is the object named *Asthmatos ciliaris* really an animal parasite? was the question which occurred to me on reading Dr. Cutter's communication. From a copious expectoration of frothy, glairy mucus I placed a portion beneath the microscope with an objective power of $\frac{1}{16}$ inch. There surely, among a multitude of other cell elements, were many specimens of the *Asthmatos ciliaris*, in lively condition and exhibiting truly "a great variety of shapes and sizes." Some of the specimens were dead, but most of them were in a state of high activity. Though stationary in position, they rocked from side to side, like Chinese idols in motion, while the cilia covering the head waved in a flame-like manner. It was the waving of the cilia which produced the rocking motion of the body.

Many of the *Asthmatos* were round and about the size of the associated mucus corpuscles, with cilia crowning rather less than half their extent, as represented in Figs. 1, 2. Others were reniform, with the cilia springing from the concave side, as seen in Figs. 3, 4. Larger ones were round, oval, or ovate, as seen in Figs. 5, 6, 7; and still larger ones were biscuit-shaped, as in Fig. 8, or gregarina-like, as in Figs. 9, 10. Others presented more or less irregular modifications of the common form of the columnar ciliated cells of the air passages, as seen in Figs. 11–15.

Many of the ciliated bodies appeared without a nucleus; others presented a pale granular globular nucleus, and occasionally one would present two such nuclei; in others the nucleus was larger and oval and provided with a nucleolus. Some of the ciliated bodies contained small pinkish vacuoles, variable in number and quite passive. There were other cells associated with the ciliated ones of the same forms, but without the cilia, as if these had been removed, as seen in Figs. 16, 17.

Though very unlike the normal ciliated epithelial cells of the pulmonary air-passages, and certainly bearing resemblance to some of the peritrichous ciliate infusorians, my interpretation of these bodies has always been that they were incomplete or deformed ciliated epithelial cells. I say has always been, for I have previously and repeatedly observed the same bodies, and it never crossed my mind that they were anything else than ciliated epithelial cells more or less modified by the condition of the catarrhal affection. With the subsidence of the catarrh, the desquamated

ciliated epithelial cells diminish in number in the expectorated mucus and finally disappear, as if they had ceased to be thrown off from the mucous membrane.

The expectorated catarrhal mucus ordinarily contains a multitude of cell elements presenting considerable variety of form, all of which I have attributed to the epithelium of the air-passages, more or less modified by the catarrhal affection. The most common constituent consists of the so-called mucus corpuscles, represented in Figs. 18–20, closely resembling colourless-blood corpuscles. These are spheroidal, pale, granular bodies, with no visible nucleus, and measuring from .009 to .012 mm. Usually isolated, they frequently lie in pairs and chains up to half a dozen or more. They often present a roughened aspect due to feeble extensions of the protoplasm as in the amœboid movement of colourless blood-corpuscles. Another element consists of larger spheroidal or ovoidal corpuscles, Figs. 21, 22, composed of granular protoplasm mingled with variable proportions of oil globules, and often appearing to have a central nucleus more or less obscured by the surrounding material. These corpuscles measure from .018 to .024 mm. or more.

In my own habitual condition of health, for several years, I have been troubled with slight bronchial irritation accompanied with occasional coughing. The expectoration in small quantity consists of clear glairy mucus with little patches of dirty-yellow muco-purulent matter. I at first attributed the dirty hue to inhaled dust, but microscopic examination showed it to depend on corpuscles like those just described, containing more or less black pigment, as exhibited in Figs. 23, 24.

Other constituents of catarrhal mucus observed in ordinary cases, that is to say in common colds, etc., are as follows: Nucleated corpuscles, as large and rather larger than the associated mucus corpuscles. They are round, oval, or irregularly polygonal, and pale granular. The nucleus is large, oval and provided with a nucleolus.

Epithelial cells of every variety, from the small pale granular nucleated form resembling the nucleated corpuscles just indicated, to the large squamous form such as line the cavity of the mouth.

Isolated granules, variable in quantity and size, some of them pale and obscurely defined, others globular and resembling molecules of oil.

Occasionally a few coloured blood-corpuscles, without the obvious presence of blood. In the crystal clear liquid which drops from the nose in the commencement of a coryza, I have at times observed two solid elements, consisting of blood-corpuscles. These were very few in number, the greater proportion being colourless corpuscles exhibiting their characteristic amœboid movements. The coloured corpuscles were so few that there were usually only from one to three at a time in the field of the microscope.
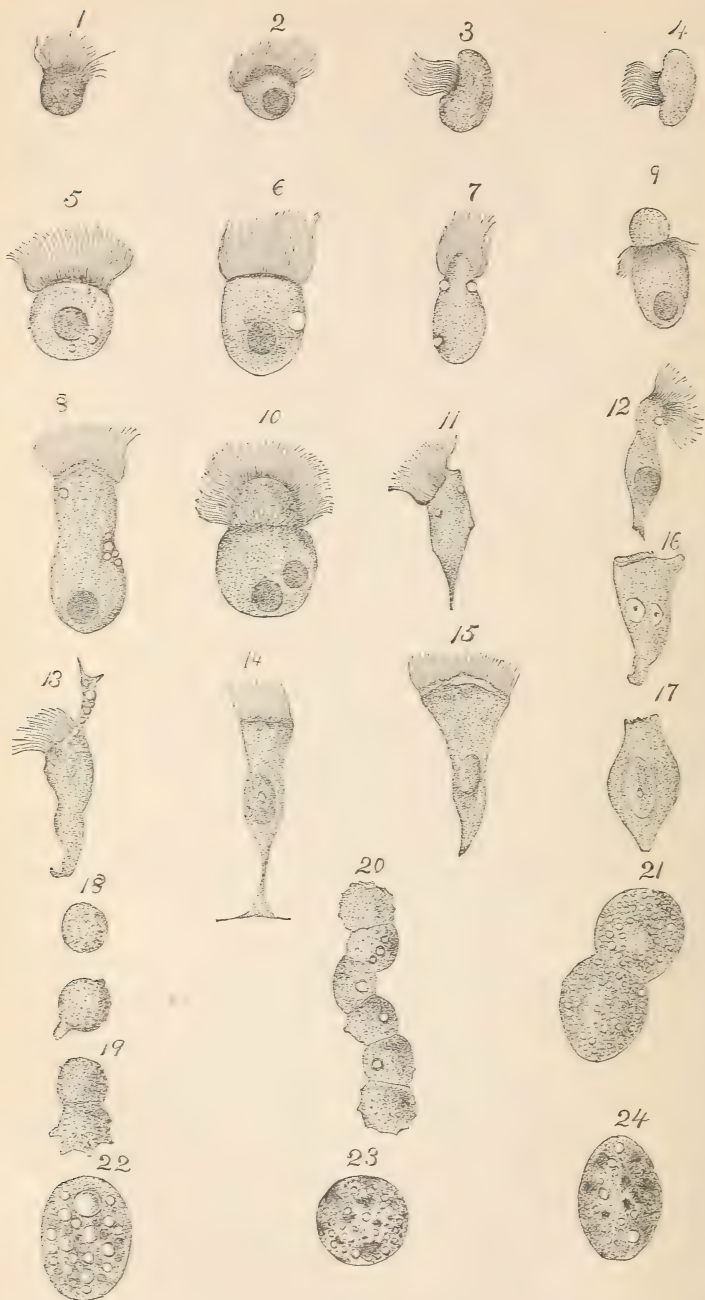
EXPLANATION OF THE FIGURES.—Cell elements of catarrhal expectoration. All the figures magnified about 650 diameters.

Figs. 1-17. Mostly deformed epithelial cells.

Fig. 1. Globular cell, .009 mm., with minute vacuoles.

Fig. 2. Globular cell, .01 mm., containing a globular nucleus.

Figs. 3, 4. Reniform cells, .015 mm. long, without visible nucleus.

Figs. 5-7. Larger round, oval, and ovoid cells, .015 to .021 mm. long, with vacuoles; two with globular nuclei, and one without nucleus.

Fig. 8. Biscuit-shaped cell, .033 mm. long, with nucleus and small vacuoles.

Fig. 9. Gregarina-like cell, .024 mm., with nucleus. The circle of cilia waved up and down, while the head-like portion was bent from side to side.

Fig. 10. Gregarina-like cell, .027 mm. long by .021 mm. wide, with two nuclei. The head appeared covered with waving cilia, and the body rocked from side to side with a slight twist.

Figs. 11, 12. Columnar cells, .027 mm. long, with minute vacuoles, and one with nucleus.

Fig. 13. Columnar cell, .03 mm., with long protoplasmic vacuolated process projecting from amidst the crown of cilia.

Figs. 14, 15. Columnar cells, of nearly normal aspect, .036 to .039 mm.

Figs. 16, 17. Columnar cells, apparently deprived of their cilia, .027 mm.; one with two nuclei, the other with a single large nucleus.

In Figs. 2, 5, 6, 8, 9, 10, 12, the nucleus resembles a mucus corpuscle; in Figs. 14–17 it has the normal appearance. The specimens of 14–17 were dead or motionless; all the others exhibited waving of the cilia with active rocking motion of the body.

Figs. 18, 19. Ordinary mucus corpuscles, .009 mm., one with pseudopodal extensions.

Fig. 19. A pair of mucus corpuscles in contact.

Fig. 20. A chain of similar corpuscles, of which several contain vacuoles.

Fig. 21. Two large mucus corpuscles, containing oil globules, etc.   Diameter .018 mm.

Fig. 22. A mucus corpuscle, with large oil globules.   Diameter .024 by .018 mm.

Fig. 23. Globular mucus corpuscle, containing pigmentary matter, .018 mm. diameter.

Fig. 24. An oval corpuscle of the same kind, .024 by .015 mm. diameter.

Article VIII.

Note on the Elimination of Antimony from the Human System. By Henry Morton, Ph.D., President of the Stevens Institute of Technology, Hoboken, N. J.

In hopes of throwing some light on certain points connected with the elimination of antimony from the human system, concerning which there seems to be a degree of discrepancy, or at least uncertainty, in the works of the standard authorities on Toxicology, the following experiments were made by the present writer. Though they are far from exhausting the line of investigation indicated, it is believed that they at least establish some valuable data, and build up some few paces of the desired road.

In order to secure material for analysis, tartar emetic, in doses of half a grain each, was administered every evening, about ten o'clock, for three successive days, and the urine discharged was collected in two portions for each twenty-four hours, one being that discharged at rising in the morning, and the other consisting of the rest discharged at various times during the day and evening.

The analyses were conducted as follows: The fluid was concentrated to about one-third its volume by evaporation on the water-bath, hydrochloric acid was added, and sulphuretted hydrogen was passed through with occasional warming for about twelve hours. The precipitate was then separated by filtration and washed thoroughly, until no trace of chlorine could be detected in the filtrate with nitrate of silver. The filter

(paper and all) was then oxidized by repeated treatment with strong nitric acid and evaporated to dryness, and further carbonized by the action of strong sulphuric acid, aided by a moderate heat, not over 100° C.

When a portion of the charred mass yielded a colorless solution in boiling water, the whole was pulverized and digested with hot water, containing a little hydrochloric acid.

The clear colourless liquid was then separated from the carbon by filtration, and treated with sulphuretted hydrogen and warmed.

Antimony when present was then precipitated in minute flocks with its characteristic orange color, as hydrated tersulphide.

An assertion having been very confidently made that such a treatment as the above would fail to detect small amounts of antimony, because the organic matter present would prevent its precipitation by sulphuretted hydrogen, it was thought worth while to settle that question once for all by a decisive experiment, although the unsupported character of the assertion hardly entitled it to so much attention.

Accordingly, in several cases, after the first treatment with sulphuretted hydrogen, the liquids passing through the filter and washings were concentrated, oxidized with nitric acid, then with hydrochloric acid and chlorate of potash, and heated on the water bath until the smell of chlorine had nearly disappeared. Water was added from time to time to replace that lost by evaporation. Sulphuretted hydrogen was then passed through the liquids, and their precipitates were treated as before.

In no case was the slightest trace of antimony discovered in any of the filtrates thus treated; from which it evidently appeared that none had escaped the first precipitation with sulphuretted hydrogen, and that no advantage would have been gained by the application of the much more elaborate treatment involved in partially oxidizing the organic matter in the first instance.

The general results are here given in tabular form as the most convenient and explicit.

June 18. 10 P. M., first dose of $\frac{1}{3}$ grain administered.

19*th*. 6 A. M., collected urine, $7\frac{1}{3}$ ounces. Slight orange precipitate.

19*th*. To 10 P. M., collected urine, 17 ounces. Orange precipitate less than the previous one.

19*th*. 10 P. M., second dose of $\frac{1}{3}$ grain administered.

20*th*. 6 A. M., collected urine, $9\frac{1}{4}$ ounces. Orange precipitate in larger amount than the first.

20*th*. To 10 P. M., collected urine, 15 ounces. Orange precipitate larger than any before.

20*th*. 10 P. M., third dose of $\frac{1}{3}$ grain administered.

21*st*. 6 A. M., collected urine, $7\frac{1}{4}$ ounces. Orange precipitate like the previous one.

21*st*. To 10 P. M., collected urine, $17\frac{1}{4}$ ounces. Orange precipitate like the last.

22*d*. 6 A. M., collected urine, 12 ounces. Orange precipitate less than those of previous day.

22*d*. To 10 P. M., 18 ounces. Orange precipitate larger than morning of same day.

23*d*. 6 A. M., collected 9 ounces. Orange precipitate less than on previous day.

23*d*. To 10 P. M., collected 19 ounces. Orange precipitate larger than in morning.

24*th*. Entire quantity collected 24 ounces. Orange precipitate about equal to second lot of June 23d.

25*th*. Entire quantity collected 30 ounces. Yellow colour appearing slowly; small precipitate only after standing ten minutes.

The above observations and results would indicate that antimony, when swallowed even in very small doses, is very promptly eliminated in part by the kidneys, and continues to be so eliminated constantly. With such small doses as were here employed, it is not likely that the elimination could have been traced much further than it was in these experiments, namely, for five days after the last dose.

The rate of elimination during these five days was steadily decreasing, the difference between the morning and later collection being simply such as should result from the larger quantity obtained in the second lot.

Whatever was the state of combination of the antimony on its elimination, it certainly was one which offered no obstruction to its precipitation by sulphuretted hydrogen applied in the usual manner.

ARTICLE IX.

EXTIRPATION OF TERATOMA; OR, TERATOID TUMOUR. By DE SAUSSURE FORD, M.D., Professor of Special and Surgical Anatomy in the Medical College of Georgia (Augusta), Med. Depart. of the University of Georgia.

MARTHA C., mulatto, aged 44, of South Carolina, presented herself Feb. 1st, 1878, with a tumour upon the side of her face and neck, extending behind the ear, pushing the pinna forwards. She first noticed tumour, when about 18 years old, as " a small lump behind her ear," which gradually enlarged; but not until 1876 did it commence to increase rapidly. She is married, still menstruates regularly, but has slight prolapsus uteri, with leucorrhœa; has borne one child, a daughter, who has children, all of whom are healthy.

I believed the tumour to be fibro-cystic, and determined to operate; but, before doing so, passed a trocar and canula into its lower anterior part, and there issued through canula bloody serum.

Operation.—Assisted by a number of my associates in the Medical College, and the class attending the lectures, on Feb. 9th, 1878, sulphuric ether having been administered, an explorative incision, two inches long, was made from upper anterior border of tumour, extending downwards through integument and anterior layer of superficial fascia, to a distinct but thin fibro-cellular envelope which inclosed the mass. To ascertain its character, an incision was made through the sac, and a part of the mass taken out, which had some of the characters of encephaloid. The incision was further extended, when hemorrhage, from the interior, welled up, and, as quickly as possible, was literally grabbled out in fragments.

The hemorrhage continuing, the large cavern was freely irrigated, with a strong solution of perchloride of iron, which soon arrested it. An attempt was made to dissect out the sac, but bleeding became so urgent, it being necessary to ligate some small vessels in the bottom of the cavern, it was determined to cut away some of the redundant integument and sac from the external border of original incisions. The flaps were united by iron-wire interrupted sutures, leaving an opening below in which was placed a drainage tent. The parts secured by the sutures healed by primary union.

Treatment.—The sac was irrigated daily with *tar-water* by means of a syringe introduced through lower opening; when the tent was applied, and a compress saturated with tar-water was adjusted firmly with a roller bandage, sulph. quinia, 5 grs. at 6, 8, and 10 A. M., daily, was administered, until the suppuration had almost entirely ceased; this medicine having proved itself, in my judgement, to be one of the most powerful antisuppurative remedies that we possess. One day the tent was omitted, the next the lower opening had united. Patient continued to do well until the 11th of March, when she had fever, and her face was very much swollen and fluctuating. The granulations in lower part were broken up with a grooved director, when a large quantity of offensive pus discharged. The pouch was again irrigated as before, and no tent used; after two or three days it again healed; on the 19th it became necessary to make a free incision into dependent part, when a half pint of offensive pus discharged, which was almost instantly *disinfected* by *tar-water* poured into the vessel which had received it. The incision healed in three days after same treatment, and the whole sac seemed to be destroyed; but on the 23d, my assistant, Dr. Thomas R. Wright, opened a small abscess behind the ear. At this time there is no appearance of return of the tumour, but there is a hard, indurated lump, of small dimensions, probably cicatricial remains of some parts of the sac.

The case being unusual, I sent a part of the tumour, with a photograph of woman before the extirpation, to my friend, Dr. Edward Wigglesworth,

of Boston, who interested himself in obtaining an analysis from Prof. R. H. Fitz, the distinguished histological authority at Harvard University, and to them am I indebted for the classification.

Microscopical Examination by Prof. Fitz.—"The portion of the tumour examined was remarkable for the number of tissues present, and the absence of any normal topographical relation between the different tissues. Islets and nodules of cartilage of irregular shapes were found imbedded within fibrous tissues ; occasional clumps of fat tissue, and rare patches of mucous tissue were also present. Bands of epithelium resembling the rete mucosum formed gland-like groups, in the midst of which rounded bodies composed of epidermoid scales were situated. To such tumours Virchow has applied the term teratoma."

It appears that these tumours are usually found in the ovary, testes, or sacro-perineal region. In the former position they are usually described as solid ovarian tumours, in the latter two, as " fœtus by inclusion" ; therefore this case seems rare and interesting.

AUGUSTA, GA., Sept. 10th, 1878.

ARTICLE X.

ON THE TREATMENT OF DYSENTERY WITH SALINE PURGATIVES. By JOHN A. LIDELL, M.D., of New York.

OF all the epidemic diseases, dysentery is the most severe and the most deadly. Outbreaks of typhoid fever, scarlet fever, smallpox, diphtheria, cerebro-spinal meningitis, and even Asiatic cholera, carry off fewer victims. Desgenettes states that dysentery killed more French soldiers between 1792 and 1815 than firearms in the great battles of the same period (*Trousseau*). In the Crimean war the British army lost 5950 men by death from diarrhœa and dysentery, it being " the amazing proportion of nearly 33 per cent. of the total deaths which are recorded during the war," while the same army lost by death from cholera only 4513, and by death from fever 3446 (*Med. and Surg. Hist. of the British Army in Turkey and the Crimea*, etc., vol. ii. pp. 84, 123, 166). In our own war of the Rebellion dysenteric diseases also headed the death list in the Union army. The medical historian of the war, Dr. Woodward, says : " 37,794 deaths of white, and 6764 of coloured troops were due to the several forms of diarrhœa and dysentery, which must, therefore, be regarded as the most important causes of the mortality from diseases in our armies." (*Med. and Surg. Hist. of the War of the Rebellion*, Part First, Medical Volume, p. xliii. Introduction). And it is not difficult to understand this relative preponderance of the mortality from dysentery, for this complaint is not only very deadly, *per se*, but it also breaks out as an epidemic much oftener than

other diseases; and, again, it invades and re-invades particular regions at short intervals. But, acute dysentery often appears sporadically, especially in private practice, where it proves to be hard to treat, and frequently kills its victim. Moreover, acute dysentery, whether epidemic or sporadic, when left to itself generally shows a tendency to get worse, and is not disposed to end spontaneously in recovery. No one will be inclined to deny, then, that the treatment of this disorder is a subject of very great importance, and well deserves all the pains that can be bestowed on its elucidation.

The writer, however, does not intend to give anything like a complete exposition of the therapeutics of dysentery in this article. He proposes to confine his attention mainly to the showing from his own experience, and that of others, the singular value of saline purgatives, when judiciously employed, in the treatment of dysentery. The subject was first brought to his notice in 1851, at Bojio Soldado, a station on the Panama railroad, in New Granada, by his friend Dr. A. C. Baker, of Barry, Pike County, Ill. Tropical dysentery was then epidemic among the labourers employed at that station in building the road, and although most of the cases did well under the ordinary treatment of calomel and opium in small doses, etc. etc., there was still a large minority that did very badly under this plan of treatment. These patients fell into a state of more or less complete collapse, closely resembling the algide stage of malario-congestive fever, and several died. In these cases the surface of the body became quite cool, much shrunken, and bedewed with clammy sweat, the face pinched and earth-coloured, the eyes sunken, the nose sharp, the hands shrivelled, the voice hollow, husky, and weak, the breath cold, the extremities, tip of nose, and tongue also cold, the pulse frequent, feeble, thready, intermittent, and finally wanting. Dr. Baker suggested the administration of cream of tartar in half ounce doses every four hours to such cases of dysentery, and gave as his reason for so doing a chapter from his own experience. He stated that in an epidemic of dysentery which once raged in Pike County, mercurials, opiates, blood-letting, both general and topical, etc., proved worse than useless, and he lost every case until he bethought himself to give the bitartrate of potassa in the manner above-mentioned, and then his success became almost as great as his failure before had been miserable. He remembered to have read somewhere, but exactly where he could not tell, that cream of tartar in purging doses had been used successfully in an epidemic of dysentery, when mercurials, opiates, antiphlogistics, and all other remedies had proved ineffectual. This happy recollection he put in practice with the excellent result just stated. The writer adopted his suggestion, with most excellent results also, in all the cases where the administration of the cream of tartar was begun in season. This plan of treatment proved most effectual in cases of bilious dysentery, and in cases where the inflammation of the colon was

complicated with malarial fever.   In such cases the cream of tartar was given in doses of three and four drachms every three or four hours until large watery motions tinged with bile were produced, and the relief as to all the distressing and dangerous symptoms produced thereby was usually something wonderful.   We ascribed the good results of this treatment, at the time, to the fact that the large, watery evacuations from the bowels greatly diminished the volume of blood in the portal vein and its tributaries, and in the organs drained by them, e. g., the stomach, liver, spleen, pancreas, and intestines, thereby lessening the congestion or stasis of blood in these organs and parts in a corresponding degree, on the one hand, and to another fact that these large serous motions washed off the acrid slime, and the scybalous and putrid feces from the inflamed surface of the bowel, placing it thereby in a condition comparatively free from irritation, and in a state the most favourable for recovery.

The following case, which occurred in private practice, will serve pretty well to illustrate the immense benefit which may be derived from the judicious administration of saline purgatives to patients suffering from dangerous forms of dysentery :—

Sept. 2. I was called from bed at 4 A. M. to visit a young girl, aged 20, said to be in a very bad way, in consequence of an attack of acute dysentery ; found that she had been sick seven days ; that she had always been healthy before this attack ; that she was suffering terribly from tormina and tenesmus ; that her bowels moved so often she could not keep an account of the number ; that her face was pinched ; her eyes hollow and sunken ; her pulse 110–120, weak and thready ; that she had great debility and intense thirst ; that the motions were very small, and consisted of clear blood, bloody mucus, bloody water like the washings of meat, and greenish frothy slime, but contained no feculent matter ; that her bowels were swollen and tender under pressure over the sigmoid flexure, descending and transverse colons, especially the first-named portion of the intestine.   I also found, on inquiry, that she had been faithfully treated with mercurials and opiates administered per orem, and with astringents and opiates introduced per anum, notwithstanding which she had gone on from bad to worse, until at the end of one week of agonizing suffering, her case was considered desperate and almost hopeless.   Ordered the following : R. Potass. tart. (soluble tartar) and Potass. bitart. āā ℥j. Misce et divid. in pulv. No. 4.   *Signa.* Give one powder every four hours until the bowels move freely.   I also went with the messenger to the drug store, and routed out from his bed the prescription clerk myself, in order that the remedy might be obtained with the least possible delay, and the treatment might be begun at the earliest possible moment.

$11\frac{1}{2}$ A. M., visited the patient again.   Her bowels were moved freely three times ; one motion, however, was very large, scybalous, and very offensive in smell.   All the urgent symptoms greatly improved.   Says she feels like another person.   Prescribed as follows : R. Pulv. ipecacuan. et Pulv. opii āā grs. vj ; Quiniæ sulph. grs. xxiv ; Extract. glycyrrhiz. q. s.   Ft. pil. No. 12.   *Signa.* Give one pill every three hours.   Give also imported Seltzer water for drink, and oatmeal gruel for food.

8½ P. M.   Says she continues to feel much better. Pulse 100 and fuller. Directed one of the cathartic powders ordered above to be administered at daybreak to-morrow morning, in the same way as the first one.

3*d*. 11½ A. M., she is still better.   Pulse 96.   The purgative brought away another large scybalous motion, with bilious and feculent matter. Had rested well through the might.

8 P. M. At this visit found that she had had six dysenteric motions since morning; tormina and tenesmus, blood and mucus, much less. Ordered the pills of ipecac., opium, and quinia to be continued, and the following to be given at a dose, at 8 o'clock, to-morrow morning; R. Ol. ricini f℥iv; Syrup. rhei aromatic. f℥vj; Extract. rhei fluid. ℳxx; Tinct. opii gtts. xx.   M.

4*th*. Visited her at noon.   She looks and feels a great deal better; bowels have not acted since the oil and rhubarb were given at 8 o'clock; pulse 90; abdominal swelling and tenderness gone.   Prescribed the following mixture: R. Ammon. muriat. ℥ij; Morphiæ muriat. gr. j; Syrup. acaciæ f℥ij.   M. *Signa.* Give one teaspoonful every three hours, mixed in water.   The object sought to be accomplished by this remedy was the relief of the intestinal catarrh, which still remained.   Beef tea for diet.

5*th*. 12¼ P. M. Found her condition very favourable at this visit; pulse 90; thirst gone.   Ordered the mixture prescribed yesterday to be continued, and a cathartic powder, consisting of potass. tart. and potass. bitart., each two drachms, the same in composition as those given when I was first called, to be taken early to-morrow morning, and repeated, if necessary, to secure free catharsis, as I feared that putrescent feces and other morbific matters were again accumulating in the diseased part of the intestinal canal.

6*th*. 12¼ P. M. Found her sitting up.   Says she feels well, although weak; pulse 85; bowels moved freely by the cathartic powder, and says she feels better for it.   Ordered the sal ammoniac mixture to be continued, and the following pills: R. Quiniæ muriat. grs. xii; Extract. nucis vomicæ alcoholic. grs. iv; Althææ cum syrupo, q. s. ut ft. pil. No. 12. *Signa.* Take one pill three times a day.

8*th*. 2 P. M. She is doing exceedingly well.   The symptoms of dysentery have all disappeared.   Cautioned her as to taking food.   Allowed her to go out of doors.   Directed her, however, to continue the sal ammoniac mixture, and the pills of quinia and nux vomica ordered on the 6th.

11*th*. Pulse 70, and normal.   Discharged her, *i. e.*, ceased my visits to the patient, because they were no longer needed.   Advised her, however, to continue the pills of quinia and nux vomica for a month, and to take the sal ammoniac mixture again, if simple looseness of the bowels should return.   But this visit ended the case, although her bowels remained weak and her stomach dyspeptic a long time.

Comments.—Under no other plan of treatment with which I am acquainted could this patient have done anything like so well as she did under the use of the tartar-salts in purging doses; indeed, there is good reason to believe that she would not have got well at all under any other method of treatment.   However this may be, the marked relief which the saline purgatives afforded her is beyond dispute.   Nor is it difficult to perceive the reason why these purgatives did so much good, when we consider the nature and quantity of the alvine evacuations which they produced,

especially on the first occasion of their use, viz., a chamber-pot almost full of horribly-smelling putrescent excrement, intermingled with hard lumps of feces or scybala. Recovery was obviously impossible until the inflamed gut was freed from this morbific matter. We can safely say that the saline cathartics were of great benefit, because they carried away the acrid slime together with the scybalous and putrefying feces from the inflamed part of her intestines, thereby placing this part in a state comparatively free from irritation and in a condition the most favourable for recovery. Impacted and decomposing feces, if allowed to remain even in bowels that are healthy, alone are enough to excite a dysenteric inflammation therein. No wonder, then, that she continued to grow worse so long as opium and astringents were administered with a view to arrest the movements of her bowels. Improvement in her case was impossible until the impacted and decomposing feces with other putrefying matters were carried away therefrom.

The case just related is the counterpart in every essential particular, excepting the patient's sex, of a sporadic case of bilious dysentery which I was brought to see, in consultation some years ago, viz. :—

December 19, 1870. The subject was a young man of good constitution, who, under a treatment consisting for the most part of opium and astringents administered for the purpose of stopping the action of his bowels, had gone on from bad to worse for a number of days, until, when I saw him, the tormina and tenesmus were terrible, and the symptoms of approaching collapse, already described, were distinctly marked and very imminent. Here, also, I insisted on the instant administration of purgatives. Consequently they were given, although with considerable reluctance, oleum ricini at first, and potassium tartrate afterwards. The operation of these purgatives was attended with an amount of relief from suffering and danger that was really wonderful to behold. This patient also made a speedy and excellent recovery.

In treating the acute and chronic forms of dysentery, I have very often had occasion to administer the saline cathartics, since their value was first brought to my notice in 1851, in the manner stated above. While serving as a medical officer in the army during the war of the Rebellion, I prescribed them in a great many cases of dysentery, and with most gratifying results. The particular salt mostly used was the sulphate of magnesia. Since the war I have prescribed the neutral salts in dysentery much more freely and much more fearlessly than I did before the war, because, perhaps, of the confidence as to their safety and value in that disease, which my army experience engendered. And I can truly say that I have never had occasion to blame myself for giving saline cathartics to patients having dysentery, whether in public or in private practice, in even a single instance ; but I have, alas ! had occasion to blame myself for not employing them freely enough in more than one instance.

Here, it may not be amiss to state that, during the latter part of 1862,

and throughout a period of seven or eight years subsequent thereto, the writer was compelled to make a frequent, sometimes almost a daily use of saline cathartics in his own person, because of chronic dysentery contracted in the swamps of the York and Chicahominy rivers, during the Army of the Potomac's campaign in this part of Virginia, that year.   No other remedy, excepting quinia, ever did him a particle of good, so far as this disease was concerned.   Opium, astringents, and stimulants always threw him into a fever, while subnitrate of bismuth, etc. etc., had no effect whatever.   In those days he always felt decidedly lighter and better after the operation of a saline cathartic.   The sense of immense distension and oppression or weight in the abdomen always passed away with the alvine evacuations produced thereby, the dysenteric motions themselves usually ceased for the time being, and, in this way, he was always made to feel much stronger and better.   I have always thought that these saline purges did me good, mainly, because they removed portal congestion by virtue of the copious watery evacuations they occasioned, *i. e.*, they directly diminished the volume of blood contained in the portal vein and its tributaries, in the coats of the intestine and stomach, in the liver, spleen, and pancreas, etc.   I have no doubt that they also did me good by washing out from my diseased bowels the acrid slime and the decomposing excrementitious matter.   Finally, under their persistent use, I have made a pretty fair, although incomplete, recovery.   I have tried a considerable variety of the saline cathartics, *e. g.*, cream of tartar, soluble tartar, Rochelle salts, citrate of magnesia, mineral water having cathartic properties such as Kissingen and that which is bottled at several springs of Saratoga, as well as Seidlitz powders, but principally the latter, for it has seemed to do best of all.   The effervescing state in which this remedy can always be taken, has proved both agreeable and useful.

I will next supplement my own experience on this subject, which has been by no means small, by adding to it that of some others whose authority is generally acknowledged by the profession.   Dr. Stokes (*Lectures on the Theory and Pract. of Physic,* p. 93, Am. ed.) says :—

"There was a very curious circumstance connected with the history of the epidemic dysentery of 1818–19.   At one time the deaths happened to be very numerous, and everything which the experience or ingenuity of Dr. Cheyne could suggest failed in arresting the disease, in many cases.   An English physician, who happened to be in Dublin at that period, and was in the habit of visiting the hospital, proposed the administration of large doses of cream of tartar, stating that he had tried it on several occasions under similar circumstances, and was convinced of its value.   As the cases were not succeeding which had been treated after any of the ordinary modes, Dr. Cheyne consented to the exhibition of the cream of tartar, and allowed the physician to prescribe and administer it himself.   Accordingly, he proceeded to give it in doses of half an ounce every fourth hour.   Its first effect, generally, was to produce violent distress, and to aggravate all the symptoms, but, after three or four doses, bilious and feculent stools came away, and the patient experienced the most extraordinary relief. Many cases which had been considered desperate improved and recovered, and Dr. Cheyne expresses his conviction that many persons were saved by this prac-

tice, who would have been lost under the ordinary modes of treatment. One of the old German authors has alluded to this singular efficacy of cream of tartar in the treatment of dysentery; and from the result of Dr. Cheyne's experiments, there can be no doubt that it is entitled to a high rank among the remedies usually employed."

Concerning the treatment of dysentery Trousseau says :—

"In 1823, Bretonneau, a man profoundly clinical, dismayed at the non-success of a system of treatment, based upon a preconceived theory rather than upon sound observation, resolved to place himself in opposition to the deplorable practice which resulted from the doctrine of the Val-de-Grace.

"Having before him, as exemplified in his own practice and that of many others, the sad results of indiscriminate resort to the antiphlogistic treatment on all occasions, and without reference to the form of the disease, he set himself to make trial of the treatment by purgatives, in accordance with the plan followed by Stoll, Zimmerman, and Pringle, all of whom stated that they had found it very useful.

"The trial was attended by success. He then sought for an explanation of the successful results obtained; and he came to the conclusion that in dysentery, as in dothinenteria, the *quality*, the specificity of the local inflammation, plays a much more important part than its *quantity:* he likewise thought, that most probably the beneficial action of purgatives was due to their substituting for a specific local inflammation of bad type, another inflammation which, although it has also a specific character, has a natural tendency to cease.

"While in respect of Broussais's doctrine theory took the lead, and moulded facts to its service, Bretonneau's doctrine advanced, under the simultaneous and combined support of observation and theory. From that time, and in the different circumstances in which he was placed, the illustrious physician of the hospital of Tours recognized that the purgative treatment was that most frequently indicated in dysentery.

"In the account given by Dr. H. Parmentier and myself of an epidemic which prevailed in 1826 in the department of Indre-et-Loire, you will find it stated that a really great proportion of recoveries followed the treatment just described. I have long employed it; and it has rendered me signal service in the different epidemics against which I have had to contend.

"Such was the case in the epidemic of 1848 in the garrison of Versailles, whither I went every morning to study the disease in the wards of the military hospital, then in charge of my honorable colleagues, Drs. Perrier, Follet, and Godard.

"In the reports communicated to the Academy of Medicine, to which I have just alluded, there is expressed an almost unanimous opinion in favour of this powerful method of treatment. Nearly all the reporters state that the administration of purgatives was the chief means by which they opposed the disease; and that the purgatives which they principally used were the neutral salts, such as sulphate of soda, sulphate of magnesia, and the neutral tartrate of potash and soda, called *sel de Seignette.*

"These are the medicines which you have seen me prescribe in the cases which have come under your observation. In my civil practice, I always have recourse to them, particularly in the commune in which my estate is situated, where this year dysentery has committed great ravages. My own household was not spared, several members having been attacked, and one child died. My farm-bailiff was seized with the malady; I gave him the neutral salts; and though he committed imprudences, he recovered. Generally, persons recover who are treated in this way.

"The evacuant method praised by the physicians of the last century, and particularly the administration of the neutral salts in purgative doses once daily, or morning and evening, so as to induce diarrhœa, is, therefore, the best treatment of dysentery.

"Does it follow that we are to confine ourselves to the use of the sulphates of soda and magnesia, and the salts of Seignette ? Certainly not; there are cases

in which other purgatives may be employed with advantage."—(*Lectures on Clinical Medicine*, vol. iv., pp. 176–178, New Syd. Soc. translation, London, 1871.)

Among purgatives other than the neutral salts that have done good service in the treatment of dysentery the mild chloride of mercury, administered in large doses, *i. e.*, in doses of twenty grains and upwards, stands the highest and deserves some mention in this place.   In several instances where the symptoms of dysentery became complicated at an early period in the history of the case with the symptoms of sudden collapse that belong to the cold stage of malario-congestive fever, incessant vomiting of bilious matter being also present, and the patient's life in imminent peril, I have administered forty grains of calomel at one dose with most excellent effect on the dysenteric as well as on the congestive phenomena. In those cases calomel was selected as the purgative to be given before exhibiting large doses of quinia, because, from the character of the vomiting, no other purgative would be likely to stay in the stomach after being swallowed.   By so doing, *i. e.*, by giving calomel and quinia in large doses, I have saved several cases of dysentery complicated with malario-congestive fever that were apparently hopeless.   I have, also, several times administered calomel in purgative doses to dysenteric patients having constant nausea with frequent vomiting when malario-congestive fever was not present, and, likewise, with most excellent effect.

In this connection it may be of interest to state that, in 1812, at Gibraltar, numerous deaths from dysentery having occurred in the garrison, Dr. Amiel, Surgeon-Major of the 12th Infantry, gave calomel in doses of about twenty-five grains, morning and evening, until the stools ceased to be mucous and sanguinolent, then the dose was reduced, and, afterwards, this remedy was discontinued altogether, lavements being used in its place.   So great was the success of this treatment that the Director-General of the Army Medical Service made obligatory its employment by all the other medical officers.   This plan of treatment, however, should not be indiscriminately used, for further experience with it has shown that it is exceedingly liable to induce ptyalism on the one hand and mercurial defibrination of the blood on the other.   But, at the same time, there are cases of dysentery where the administration of calomel in purgative doses is absolutely demanded ; such, for example, as cases of dysentery attended with vomiting, where nothing but some weighty substance like calomel can be retained on the stomach ; and cases of dysentery complicated with malario-congestive fever of a very dangerous type ; and, lastly, cases of dysentery occurring in children who, for the most part, refuse to take the saline and many other purgatives on account of their disagreeable taste, but who will readily take calomel, especially if it be given in the form of powders combined with sugar.   It is not improbable that when calomel is administered in minute doses in dysentery with benefit, the good it does is mainly due to its purgative properties.

As for myself, the longer I live, and the more cases of dysentery I treat, and the better I become acquainted with this disease, the more I am inclined to agree with Trousseau in declaring that "in point of fact, in accordance with Stoll's correct observation, dysentery ought to be considered as one of those disorders in which the bowels are confined," and, therefore, a disorder which, for the most part, should be treated with opening medicine.

With regard to the use of opium, and binding medicines in general, in the treatment of dysentery, I have related two cases above which show how they may be administered with very damaging effect. I have, therefore, to enter my protest against the lamentable manner in which these medicines are too often abused. When opium is indicated it is not for the purpose of stopping the dysenteric flux, but for moderating the accompanying pains, and especially for checking the vomiting which renders the administration of other remedies impossible. The doses of opium must be small, usually not more than one-fourth of a grain of the powder, or one-sixteenth of a grain of morphia, and repeated at short intervals, for by giving large doses, the malady will become complicated by formidable typhoid symptoms.

The cases of dysentery which especially demand the exhibition of saline purgatives are : 1. Those in which the bowels are habitually constipated, for example females, and people of sedentary habits, for such cases are generally burdened with intestinal accumulations which can be gotten rid of only by repeated doses of purgative medicine; 2. Cases of bilious dysentery; 3. Cases where portal congestion is present; 4. Cases complicated with malarial fever, or with malarial intoxication and ague-cake ; and, 5. Cases of chronic dysentery. In all cases the doses should be repeated until bilious and feculent matter appears in the stools.

Saline purgatives do good in dysentery, 1, by diminishing the quantity of blood in the portal vein and its tributaries, and in the abdominal organs generally ; 2, by expelling the noxious contents of the intestinal canal ; and, 3, according to Bretonneau, by substituting for a specific local inflammation of bad type, another inflammation which, although it is specific, is of benign type. The potassium tartrate and the potassium bitartrate should generally be preferred.

The treatment of certain forms of dysentery with saline purgatives, which I have recommended above as based on my own observations and on the experience of many physicians, is unfortunately not infallible, although many patients may be saved by it who would otherwise be lost. In conclusion, I repeat, that epidemic dysentery is the most formidable and dangerous of all the epidemic diseases.

46 WASHINGTON SQUARE, Nov. 1, 1878.

Article XI.

INEQUALITY IN LENGTH OF THE LOWER LIMBS, WITH A REPORT OF AN IMPORTANT SUIT FOR MALPRACTICE; AND ALSO A CLAIM FOR PRIORITY. By WILLIAM HUNT, M.D., Surgeon to the Pennsylvania Hospital, Phila.

On the 12th and 13th of April, 1878, an interesting suit for malpractice was tried before Judge Junkin, in New Bloomfield, Perry County, Pa. The case was that of Weaver *versus* Strickler. On the 10th of March, 1877, Weaver's child, a boy in the eighth year of his age, broke his thigh. Dr. Strickler was called, and pronounced the limb fractured near the knee. There did not appear to the eye to be any material shortening or deformity. The doctor moulded splints of stiff binder's board to the limb after reducing the fracture, and kept the boy in bed. The patient did well, and at the end of four or five weeks the father told Dr. Strickler that he need not attend any more, as he himself could now manage the splints. The doctor did not see the boy again for some weeks, when he was called upon by the father, who told him that he had made a great mistake, that he had said that the limb was broken near the knee, when, in reality, it was broken in the upper part of the thigh, as there was a lump showing itself there. Dr. Strickler immediately visited the patient, and examined the limb. He found union perfect, but, much to his chagrin, there was a projection (the lump in question) at the junction of the upper and middle thirds. The shortening was, by his measurement, three-quarters of an inch. Weaver claimed that his boy was irretrievably injured, and shortly afterwards entered suit for damages against the doctor. During the year before the trial the boy obtained very good use of his limb.

Dr. D. Hayes Agnew and myself were summoned as experts by the defendant. When the trial came on, the judge directed that we should take the boy into a private room, and there examine him thoroughly. Neither of us had seen him before. He was stripped and laid upon a table. By accurate measurement we found five-eighths of an inch shortening, or rather this difference between the two limbs. There was a bony projection upon the upper part of the injured thigh, but the line of the limb was normal. There was a slight increase in thickness of bone above the knee on the same side. The joint movements were perfect. The boy was able to walk and run with a very slight, if any, limp.

The witnesses for the plaintiff were the father, the mother, and a number of medical gentlemen. After the parents' stories were heard as to the sufferings of the patient, his treatment by the doctor, and his present condition, the surgeons were called. All appeared to be men of intelligence and experience, and I think each one testified that, however differently he might have treated the case had it been his, the result was equal to the

average of recoveries after such injuries. The usual confusion was made by the lawyers as to extension and counter-extension, as to their absolute necessity in treatment, as to the sufficiency or insufficiency of the means used in the cure, and, above all, great stress was laid upon the fact that the limb was declared to be broken where in fact there was no fracture. The deformity and future prospects of the little patient were, of course, strongly presented.

Dr. Strickler himself was the first witness called for the defence. He acknowledged his diagnosis of a fracture near the knee; he said there was very little perceptible shortening at the time, and finding that his binder's-board splints retained the limb in good position, he continued the treatment until he was discharged from the care of the case. He also acknowledged his surprise at finding the "lump" in the upper part of the thigh, and was in doubt as to what it was. Whilst sitting in court, Dr. Agnew and myself were trying to reconcile the facts of the case, and to explain the diagnosis. We each drew a diagram, and agreed upon one which, without any forced construction, seemed to fit the case, and which was shown to the jury, and carefully explained by the defence (See figure). The thigh might have been really broken near the knee on the inner side, and yet the fracture might have been a very oblique one, and thus the projection of the upper end of the lower fragment may be accounted for.
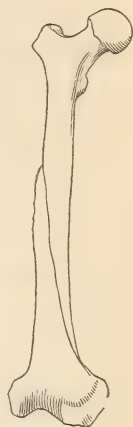
The writer was the first expert witness examined for the defence. He testified as to the various methods of treating fractures of the thigh; that any particular method is a matter of choice by the surgeon; that frequently splints and pressure are sufficient, especially for children, and that he had, at that very time, cases under treatment with stiff binder's-board splints; that experience, knowledge, and watchfulness were more essential than any especial boards and bandages; and that, provided the parts were kept in apposition and in healthy condition, it made no particular difference how it was done; often it was done with no splints at all. The diagram was produced and explained to the judge and jury. The projection was accounted for; but how about the shortening? Was there lameness enough to indicate much real shortening? No. Here comes an episode in our narrative. Between the morning and afternoon sessions of the court, and before the defence was called, a group of us were standing at the door of Dr. Strickler's office, and with us a little boy of the doctor's, who was in the twelfth year of his age. Finding that he had never been the subject of injury, I proposed that we should take him into the doctor's office, and strip and measure him. Agreed. We laid him upon

a flat wooden settee, and after taking the utmost care as to position and lines, Drs. Agnew, Strickler, Orris (I think), and myself, measured him. We all agreed as to there being three-eighths of an inch difference between the two limbs, measuring from the anterior-superior spines to the internal malleoli. This fact was communicated to Mr. W. N. Seibert, who ably conducted the examinations for the defence.

To return to court: my examination was continued, and the above fact was ingeniously brought out somewhat in this way: "Q. Doctor, are you aware that a person who has never been injured may present differences of length in the measurements of his own limbs? Ans. I am. Q. Is that the rule as to most persons, or is it the exception? Ans. I believe it to be the rule. Q. What is the range of difference, so far as you know? Ans. Say from an inch and a quarter to nothing. Q. And nothing is the exception? Ans. Yes. Q. Have you measured anybody recently? Ans. Yes. Q. When? Ans. To-day. Q. Anybody in this village? Ans. Yes, sir. Q. Who? Ans. Dr. Strickler's little son. Q. What did you find with him? Ans. A difference of three-eighths of an inch. Q. And five-eighths of an inch is all Dr. Agnew and yourself found in Weaver's boy? Ans. Yes, sir."

I think I was subjected to no cross-examination. It was late at night, and the court adjourned. In the morning Dr. Agnew was called. Very much the same ground was gone over, of course, as in the writer's examination, for we both had precisely the same opportunities of examining the case, but the weight of the Professor's opinions and experiences was evidently a power in the court. I think, also, here there was very little, if any, cross-examination.

After Dr. Agnew left the stand the plaintiff's counsel held a short consultation, and, much to our surprise, abandoned the case, technically, I believe, took a nonsuit.

Thus ended the first trial for malpractice, in which the new facts as to measurements were brought with great effect before a legal tribunal.[1]

Not the least interesting fact to note here is, that the defendant's experts were surgeons of the Institution where the observations as to the inequality of the lower limbs in the same person were originally made.

During the past two years frequent notices of this discovery and of its importance have appeared in the medical, scientific, and popular journals, and also in the newspapers. The credit, however, is always given to Dr. Wight, of Brooklyn, N. Y., or to a surgeon of Brooklyn, New York.

Dr. Wight's first paper that I can find appeared in the *Archives of*

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[1] Mr. Seibert writes under date of September 20, 1878. "The boy, J. B. Weaver, has perfect use of his leg, if his free running about upon the street with other boys of his age (between whom and him there is no visible difference in use and perfect locomotion) is to be the matter upon which judgment is based."

Clinical Surgery, vol. i., No. 8, February, 1877, New York.   His second paper is in the *Proceedings of the Medical Society of the County of Kings*, stated meeting, January 21, 1878.

Therefore, besides reporting this case for its intrinsic interest and importance, I have another object in view in the same connection.   I wish to make a claim of priority in *the discovery and full surgical appreciation of the fact that asymmetry as to length of the lower limbs of the same person is the rule and not the exception.*   Some time about 1872 and 1873, the members of the surgical staff of the Pennsylvania Hospital, then consisting of Drs. Hewson, Hunt, Morton, and Levis, were greatly interested in the subject of measuring.   The discrepancies were found to be puzzling, and it was difficult to reconcile them.   Dr. Morton had in his wards a case of fractured thigh which resulted in perfect union, but the broken limb was half an inch longer than the sound one, although it appeared to make no difference to the man after he got about.   This led Dr. Morton to devise a measuring instrument, consisting of a delicate central bar with cross slides and stops.   Even with this instrument irregularities were noticed which were difficult to account for.   Dr. W. C. Cox was then Dr. Morton's resident and assistant, and it had already occurred to him to measure both sides of persons who had never been the subjects of injury.   He used the measuring tape.   The results were so surprising as to encourage further investigation.

The writer of this article took great interest in the matter, and the first note he can find about it is one written by him, and published in the *Philadelphia Medical Times* of January 16, 1875, under the heading " Clinical Notes and Reflections."   In it he says, " It is well known that bilateral symmetry may be said not to exist as to breadth, but has it ever occurred to any one to state as a law that bilateral symmetry as to length is exceptional ?"

In the mean time Dr. Cox's measurements were continued, and in the April, 1875, number of the *American Journal of the Medical Sciences*, he published his first table, giving the results in fifty-four sound persons. The variations were from $\frac{1}{8}$ to $\frac{7}{8}$ of an inch, and only six persons in the list presented equal lengths of the lower limbs.

After this paper was published our interest in the matter did not cease. I frequently made the remark that the publication of it did not attract nearly the attention that it deserved from the profession.   I had some correspondence about it.   Among others, I wrote to Drs. Billings and Baxter, of the U. S. Army, for I noticed in the volume of medical statistics from the Provost Marshal General's Office, 1875, where there is a great deal on the subject of anthropometry, that nothing whatever is said on the point in question.   These gentlemen were kind enough to be interested, and promised, if possible, to aid in further investigation.

The following letter was received after the writer had read my paper calling attention to Dr. Cox's forthcoming article.

London, February 5, 1875.

Dear Sir :—I thank you for sending me your paper of January 16. The part on measurement I have read with much interest, but I doubt whether a want of symmetry will appear if the estimate be made with the eye. I very rarely use measuring tapes or anything but the eye. The eye is surely more exact.   Very truly yours,

Dr. Hunt.   JAMES PAGET.

It appears evident that the distinguished surgeon had experienced the difficulties and puzzles of measurements, and had as a rule given them up.

It is not my intention to discuss here the causes of the inequalities under notice, or in what parts they are to be found. These have already been fully considered. Dr. J. B. Roberts has an interesting paper in the *Philadelphia Medical Times* of August 3, 1878, in which he gives the measurements of the lower extremities of eight skeletons. Asymmetry here is the rule. I differ, however, from the doctor in his remark, "It occurred to me that we could *best settle* the question by taking the bony skeleton itself." The practical question for the surgeon is, does the lower extremity of one side of the normal living man differ from the other in length as a rule ? Many factors may enter into accounting for the difference. We have to deal with the living man, and we should recognize these differences whether congenital or acquired in corresponding parts of *the individual*, so that when accident or disease makes him a subject of treatment, we need not try to force a result that cannot be attained. The American Medical Association did well to commit itself to no such dogma as this.

That eminent authority on fractures, Dr. Frank H. Hamilton, was at first unwilling to admit these important new facts as to measurements. He is now, from his own researches and from those of Dr. Cox and Dr. Wight, fully convinced of their truth. He writes to me, " I think the subject of sufficient importance and so creditable to American study, as to entitle it to a more conspicuous notice and a faithful historical record," and wishes that I would undertake the task.

In this short record I give the dates. These are so wide apart as to leave no room for controversy. Dr. Wight's papers are most elaborate and important contributions to surgery. In a foot-note at the end of the paper in the *Archives* of February, 1877, the work of Dr. Cox is mentioned, with the references to it. Dr. Wight speaks of it as substantiating his own observations, but does not allude to it in the body of either of his articles. There is a statement, however, on page 348 of the *Proceedings of the Medical Society of the County of Kings* which requires correction. Dr. Wight says, " Now, as near as I can determine from the sources of information at hand, about 900 cases of fracture of the bones of the lower extremities were treated in the Pennsylvania Hospital during a period of

123 years ; a very liberal estimate would make 400 of these cases fractures of the femur.'' The sources must have been meagre, for here is the record :—

During a period of 127 years, terminating 4th month 27, 1878, 11,161 fractures of all kinds were treated in the Pennsylvania Hospital !

This is exclusive of a very large number cared for by the out department. Owing to so many walking cases, any table or yearly report will show that about half of those treated *in* the house are injuries of the lower extremities. In 44 years alone, *i. e.*, from 1830 to 1874, 3816 cases of fractures of the lower extremities are recorded and analyzed, and of these 1181 were fractures of the thigh.

In the same time 3760 cases of fractures of the upper extremities were treated.

From the whole number then, and from this completed record, it is fair to presume that the number of fractures of the lower extremities treated in the Pennsylvania Hospital since its foundation must be quite, if not more than *six thousand.*

Article XII.

THE SEDATIVE ACTION OF QUINIA ON THE NECK OF THE BLADDER. By D. B. Simmons, M.D., Chief Surgeon to Ken Hospital, Yokohama, Japan.

THE relief obtained from some of the more distressing symptoms attendant upon certain affections of the bladder, by the injection of quinia into that viscus, is pretty generally known.

I do not remember having seen it anywhere stated, however, that the same results may be obtained by the administration of this drug, by the stomach. It was a mere accident that I discovered this fact, while attempting to relieve, in a young man of 26, by all the means known to science, the most painful and persistent vesical tenesmus I have ever met with. Though the case is obscure, I believe it to be one of " villous growth'' of the bladder, situated near the neck. Having occasion to administer some quinia for symptoms of a malarial character, the patient took by mistake the fifteen grains at once, which was ordered in divided doses. In about one and a half hour his tenesmus was *almost completely relieved*, but it returned, however, after eight or ten hours, though less severely.

As the patient declared the quinia had given him this short respite from long suffering, I repeated the dose, with the same result. Being an intelligent fellow, I now gave orders that a number of packages of the drug be given him, of 10 grains each, to be used as the relief obtained by each dose passed off. In the course of two or three days he came to find that

10 grains, morning, noon, and night, sufficed; and though his desire to pass water every fifteen or twenty minutes continued about as usual, there was no pain. The contractions of the bladder were evidently the same, but the uncontrollable desire to do more than empty the viscus, as is evidently the mechanism of what we understand by tenesmus, was wanting. The urine, small as the quantity may have been, simply flowed out, and nothing more. Though I had some time before injected *quinia* into the bladder, in the usual quantity and manner, the mere passage of the catheter, however, caused so much pain and bleeding, that the patient refused to continue it, or give it a fair trial, the relief gained at that time not being very apparent. I have since persuaded him to try it again, more for the purpose of testing the value of the two means of administering the medicine than to better his condition. This time he found relief (the medicine by the stomach having been discontinued), but not equal to that obtained by the other method. I then asked him to use both at the same time, the quantities of the quinia to be about equally divided, *i. e.*, 15 grains by the stomach and 15 by the urethra. By this plan there has been a decided gain over either separately, so that the patient insists on carrying it out. As far as I have been able to ascertain the time, in this case, for the effect of the drug to be felt in a relief of the symptoms, is about the same, whether administered by the stomach or urethra, viz., one and a half to two hours.

Since making the above observations, Dr. Eldridge, of this place, and Dr. Price, of the U. S. Navy, have, at my suggestion, tried the administration of quinia by the stomach in two very severe cases of vesical tenesmus. In one, a very severe and old cystitis, the relief was very decided; and, in the other, a cure was effected by two 10-grain doses—probable cause retrocessive gonorrhœa. In the latter class of cases I anticipate the quinia treatment will be of great service, though not having had an opportunity to put it to the test myself. Here, especially, it would have decided advantages over the injection of the medicine into the urethra, though I am not aware it has been used in this class of cases, in this manner.

The practice of administering a full dose of quinia, or even several doses, before operating on the urethra, is, I believe adopted by most surgeons with the idea that it renders less liable the so-called urethral chill, but *how*, I have never seen satisfactorily explained. I think, however, that in view of the above facts, this question is answered by the heading of this article, viz., the sedative action of quinia on the neck of the bladder, whereby the nervous shock (whatever this may be) of the operation is prevented. It is a question of no little interest in this connection, whether the drug acts through the medium of the nervous centres or directly on the terminal nerves of the part, after elimination by the kidneys.

October 11th, 1878.

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ARTICLE XIII.

ACTION OF THE CILIARY MUSCLE IN ASTIGMATISM. By H. GRADLE, M.D.,
of Chicago.

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CAN regular astigmatism be partly or wholly corrected by an unequal contracture of the ciliary muscle? This question was answered in the affirmative some ten years ago by Dobrowsky, and his opinion has since been generally adopted. It is rare, however, that so positive a proof of it can be furnished as by the following case:—

A. S., 17 years of age, had complained of ocular fatigue and even slight pain for many years. One year ago he obtained a pair of concave cylinders 24, but the old trouble was but little alleviated. On examination I found a convergent strabismus of the left eye, with a slightly paretic condition of the external rectus. On covering the other eye the usual secondary deviation occurred, slightly more excursive, than the primary deviation of the left eye, while both eyes performed oscillatory movements. This nystagmus I could time very easily; it consisted of a comparatively slow movement of the left eye towards the right side (action of rectus internus), alternating with a rapid jerk to the left, in order to bring the visual axis again into the desired direction. The movements of the other (not squinting) eye were the same in direction and evidently secondary, *i. e.*, due to association. This nystagmus occurred only when the right eye was covered; its cause must be sought in the insufficiency of the paretic external rectus of the left eye. The directions of these ocular movements and of the *apparent* motion of external objects resulting from the nystagmus, corresponded with the ocular phenomena due to vertigo or lesions of the semicircular canals.[1] Omitting further discussion of these motor anomalies, as well as all irrelevant details, I can describe the optic condition of the left (strabismic) eye as a myopic astigmatism of about 10 dioptrics; accurate determination being impossible on account of the diminished visual acuity (V not quite $\frac{20}{200}$). The sight of the right was also less than normal, its corrected V being $\frac{20}{80}$, while the apparent refraction was M 2 D with As M 5 D. After a thorough use of atropia for two days, I re-examined and found the correcting glass for the left eye equal to cylinder —10 dioptrics. But since the amblyopic eye did not take part in binocular vision, all further remarks apply only to the right eye, the correcting glass of which, when atropinized, was found to be cylinder —6 D, axis horizontal. There was, besides, considerable irregular astigmatism, which could only be remedied by a stenopaic slit.

A fortnight later Mr. S. returned, complaining that he could not use his glasses for reading, although reading was possible with his former spectacles (cyl. —24), and even with the naked eye. For the distance his glasses gave perfect satisfaction, his sight had even improved ($V\frac{20}{60}$), since he had learned to ignore the circles of dispersion due to the irregular astigmatism. The effects of atropia had completely disappeared as far as the iris was concerned, and on removing his glasses I could satisfy myself that his power of accommodation was the same as before the use of atropia. It seemed to me most likely that his inability to read with his correcting glasses was owing to a *partial* contraction of the ciliary muscle,

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[1] *Vide* H. Gradle, Chicago Med. Journal and Examiner, Aug. 1878.

tending by itself to correct his astigmatism, and hence rendering the glass, which was exact for the distance, too strong for the near point. I tested this view with some large print, which the patient read distinctly at a distance with his glass. On bringing the paper nearer to the eye, it began to get blurred at a distance of one metre, the indistinctness increasing with the proximity to the eye. In order to maintain distinctness, it was found necessary to diminish the strength of his correcting glass (cylinder —6 D, axis horizontal) by neutralization with convex cylinders in the ratio of the proximity of the object. Thus at one metre distance the strength of his glass had to be reduced by one dioptric, while with an object 25 centimetres off a convex cylinder of 4 D was required to neutralize the excessive strength of his own glass. While the ciliary muscle was completely at rest on correcting the eye for the distance, there occurred—evidently from previous habit—a partial contraction (of those fibres only influencing the horizontal meridian of the lens) on attempting to see close by. In the absence of any glass, *the eye would have corrected in part its own astigmatism, the degree of correction increasing with the proximity of the object.* The inability to contract the ciliary muscle uniformly was shown by the following crucial test. An emmetropic eye can see plainly in the distance through any concave glass, which it can overcome by its own accommodation. But this patient, with his eye corrected for the distance, could *not* see distinctly through a concave glass of 4 dioptrics. Instead of an accommodative effort equal to a spherical glass of 4 D, his ciliary muscle increased the refraction of the *horizontal* meridian only, and in order to see distinctly, it was necessary to use an additional *convex cylinder of 4 D, axis horizontal* (or in other words to diminish his correcting glass from a concave cylinder of 6 D, axis horizontal, to 2 D, the remnant of his astigmatism being neutralized by his own accommodation).

My assurance, that the patient would gradually learn to contract his ciliary muscle uniformly, and get his eye accustomed to the full artificial correction of its astigmatism, proved correct. One week later reading became easier, and, testing him with glasses, only weaker convex cylinders were required to neutralize the excessive strength of his own glass for the near point. Within about six weeks all trouble had disappeared, and the mode of ciliary contraction had become normal.

In the above description I have referred to ciliary contraction as the cause of accommodation for the near point, notwithstanding the objections urged by Dr. M. J. De Rosset. In the last number of this Journal Dr. De Rosset attempted to overthrow the usually accepted theory of accommodation, substituting for it the statement, that accommodation for the near point is the result of *relaxation* of the ciliary muscle, while the adjustment of the eye for distance depends on the contraction of the same. His main arguments, however, belong to the class of " circumstantial evidence," which must receive an interpretation, in order to be utilized ; and the interpretation according to the Helmholtz theory appears natural. But apart from indirect arguments, the theory of Helmholtz is directly proven by the experiments of Hensen and Völkers. Every excitation of the ciliary ganglion or nerves caused in their experiments an accommodative movement. This they demonstrated by needles introduced as

levers through the sclerotic. The needle piercing the ciliary body, and the one passing through the fovea centralis did not move, the others did, demonstrating, *that a ciliary contraction pulls the choroid forward.* Other needles acted upon as levers by the surfaces of the lens showed, that with increasing convexity the anterior surface of the lens advances considerably, while the posterior surface recedes very slightly. A last lever finally proved the advancement of the zonula with every accommodative effort. The movements of the lens could even be observed directly on ablation of the cornea. These observations pertain not only to the eyes of the dog, cat, and monkey, but were also confirmed on an extirpated human eye. They establish positively the following as the order of cause and effect: nerve-excitation, contraction of the ciliary muscle, advancement of the insertion of the zonula, and hence its relaxation, increasing convexity of the lens.

The doubts which De Rosset expresses as to the more recent experiments of Hensen and Völkers do not seem justified. Whenever the experiment did succeed, they obtained an accommodative movement from excitation of the trunk of the motor oculi. The want of success in many experiments does not surprise any one familiar with the mutilations incident to, and the difficulty of experiments on, intracranial nerves. The belief that any other nerve is concerned in the function of accommodation has no experimental or clinical basis. In previous experiments Trautvetter had also failed to obtain an accommodative response from excitation of the third nerve in mammals, probably on account of similar difficulties. In birds, however, accommodation for the near point was obtained by stimulation of the motor oculi.

The positive evidence of these experiments once accepted, the further arguments of Dr. De Rosset lose their validity.[1]

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[1] The last number of the *Centralblatt f. d. Med. Wiss.* (No. 43, 1878) contains a communication by Dr. J. Hock, of Vienna, which fully corroborates the experiments of Hensen and Völkers, on stimulation of the short root of the ciliary ganglion (the motor oculi nerve). In curarized dogs he could easily observe the increase of convexity of the anterior surface of the lens as manifested in the changed size of the reflected image of a calcium light. In order to keep the pupil dilated during excitation of the third nerve, he resorted ingeniously to simultaneous excitation of the sympathetic. Needles piercing the sclerotic showed further that a ciliary contraction pulls the choroid forward, but does not act directly on the vitreous body. All manifestations of contraction of the ciliary muscle were completely prevented by an energetic application of atropia.

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ARTICLE XIV.

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THE POTASSIUM BROMIDE AND SUSPENSION OF THE ACTION OF THE STO-
MACH IN THE TREATMENT OF UNCONTROLLABLE VOMITING OF PREG-
NANCY.   By SAMUEL C. BUSEY, M.D., Washington, D. C., Professor of
the Theory and Practice of Medicine, Medical Department of the University
of Georgetown.

IN the number of the *American Journal of the Medical Sciences* for
January, 1878, p. 146, I published several cases of this intractable affec-
tion, treated successfully with this salt, administered in the form of ene-
mata, in combination with nutrient and stimulating ingredients.   Since
the publication of those cases another has occurred in my practice, the
history of which is as follows :—

On May 20th (1878) I was called to see the wife of a brother practitioner,
who had been suffering for several days previously with constant nausea,
but vomiting only after ingesting food or drink.   Not regarding the case
as a serious one, I simply interdicted the ingestion of anything but milk
mixed with lime-water in moderate quantities, and ordered the oxalate of
cerium in three-grain doses every three hours.   This proved sufficient, and
she resumed her accustomed diet in a few days.   My attendance ceased on
the 27th.   She was three and a half months in her third pregnancy.   She
had aborted at about the same period of the two preceding pregnancies, but
had not during either of them been annoyed with any nausea.   The al-
leged cause of this attack was fright, and to a like cause she attributed the
abortions.   She is a corpulent woman, and was previous to this attack in
good health.

On the eve of my departure to the meeting of the American Medical
Association, at Buffalo (June 2), I was again called to see her, and found
her suffering more than at any time during the first attack.   She had taken
the night before a purgative, consisting of blue mass and rhubarb, to re-
lieve constipation.   To this dose I attributed the recurrence, and suppos-
ing it would be relieved with the free evacuation of the bowels, I simply
ordered pellets of ice at short intervals, and an effervescing draught of the
granulated nitrate of cerium, but left directions that if the nausea and
vomiting should persist, the oxalate of cerium should be resumed, and that
failing the enemata should be given.

She continued to grow worse.   The oxalate failed.   A single enema,
consisting of $\bar{3}$ij of beef-tea, $\bar{3}$j of brandy, five drops of laudanum, and
thirty grains of the bromide, was administered, but occasioned so much
pain and distress that she positively refused to allow a repetition.   On
Thursday the 6th her condition became alarming, and Prof. Kleinschmidt
was summoned to see her.   He furnishes the following memoranda :—

"On the afternoon of Thursday, June 6th, Dr. ———— came to me for
the purpose of consulting me upon the case of Mrs. ————.   After de-
tailing the course and symptoms of her trouble, he stated, in reply to my
question, that among a number of remedies that had been tried the last
was potas. bromid. given per anum.   It had to a certain degree controlled
the attacks of vomiting, but he had not given the drug for several days, fear-
ing that the great depression of the heart's action, which now was a promi-
nent feature of the case, was, in part at least, due to its action.

"Upon visiting patient, found her in bed ; her face was slightly mottled as if from passive congestion ; head and feet cold, pulse 160, feeble and of low pressure. She complained of severe paroxysmal pain about the region of the ductus communis choledochus, and was troubled by frequent attacks of a violent singultus. Had vomited just before my arrival, indeed had done so at intervals of one or two hours all day and the preceding night. No tenderness upon pressure over umbilical and iliac regions. She was very despondent, thought she would never get well, etc. In view of the therapeutic history, which included nearly all the remedies suggested for this complication of pregnancy, I was at a loss to suggest with any reasonable hope of success in an intractable case as the present appeared to be. I finally proposed to give a trial to acid. hydrocyan., which was one of the remedies that had not as yet been used ; suggesting the following formula : R. Acid. hydrocyan. dilut. gtt. xij, potas. nitr. ℨij, mist. menth. ℥vj. Dose, ℥ss every four hours. Patient to have ice and beef-tea in small quantities.

"Saw her again at 10 A. M. the following day. Taken altogether, her condition was somewhat improved. She had had a few hours of sleep, and had vomited but three times during the night, and twice since daybreak. Complained, however, of a constant fulness about the rectum, with an indication to evacuate her bowels, but upon repeated attempts had failed to do so. Had taken three doses of the mixture. Pulse 140, slight improvement in arterial pressure. Dr. ———, to whom I made the suggestion, that, in view of the failure of the acid to absolutely arrest the vomiting, we had better give the bromide another trial, still objecting for the reasons already given, the present treatment was continued ; without marked change in the symptoms until Saturday, when Dr. Busey returned from Buffalo ; re-instituting the injections of potass. bromid. with the remarkable and gratifying results detailed in his history of the case. I may state that I saw patient but three or four times before Dr. Busey's return."

Such was her condition at my visit in the afternoon of June 8th. A vaginal examination, made during this visit, was unsatisfactory. The index finger could be only partially introduced, because of the exquisite sensitiveness of the ostium vaginæ and spasm of the sphincter cunni, a condition not unlike that present in cases of vaginismus. It was impossible to determine the extent of the sensitiveness beyond the ostium. The uterus was depressed, the os seeming to press firmly against the pelvic floor. Flexion could not be detected, though it is not believed that there was any. Bi-manual examination was precluded by the condition of the genital canal, the thickness of the abdominal walls, and the aggravation of the nausea and hiccough by very slight pressure upon the abdominal surface.

At 6 P. M. (8th) an enema was administered, consisting of ℥ij of beef essence, thirty grains of the bromide of potash, ℥ss of brandy, and ten drops of laudanum, which was repeated at intervals of four hours until five had been given, then the intervals were lengthened to six, eight, and twelve hours successively. In some of the enemata milk was substituted for the beef essence. The first one occasioned considerable distress in the rectum, but with the aid of firm pressure to the anus it was retained, and the pain soon subsided. She vomited once several hours after the administration of the first enema, and when three had been given the nausea ceased. Nothing, except pellets of ice at brief intervals, was permitted to be taken by the mouth until after the administration of the fifth enema ;

then rice-water, at first in quantities not exceeding a teaspoonful, was given at intervals of half an hour.   After the expiration of several hours champagne in drachm doses was allowed.   On the second day after the resumption of alimentation by the stomach, milk was substituted for the rice-water in limited quantity in the beginning, but increased as the convalescence progressed.   As usual in these cases recuperation was slow.   Sometimes weeks elapse before recovery can be considered complete.   During this period great care is requisite in directing the gradual and prudent resumption of accustomed diet.   My patient had no recurrence, but her convalescence was interrupted by the supervention of two phenomena which I had not observed in previous cases.   Well-marked jaundice appeared several days after the cessation of the nausea, associated with tenderness in the region of the paroxysmal pain previously referred to which had continued unabated.   This I ascribed to the presence of gastro-duodenal catarrh.   After a free evacuation of the bowels, which was secured by a lavement of tepid water, the icterus, together with the concomitant symptoms, subsided.   Subsequently she was seized with a violent pain, which she described as beginning behind the symphysis pubis and extending obliquely upwards across the left iliac region, continuous in character, but unaccompanied with any tenderness along its course or with elevation of temperature.   It recurred at the same hour (4 A. M.) three successive mornings, and was relieved each time by an enema of thirty drops of laudanum.

In this case as in those previously published, stomachal alimentation was prohibited for a time, and only gradually resumed by the ingestion in very small quantities of unirritating and bland articles of diet.   I, as well as those who have witnessed with me the cases reported, have ascribed the rapid amelioration and complete subsidence of the distressing disturbances of the stomach to the influence of the potassium salt in subduing the irritation supposed to be due to distension of the uterine structure.   Salutary as this influence may have been, it is not improbable that it has been overestimated.   It may be that the prohibition of stomachal alimentation, thus securing rest to that organ, was equally important, and, perhaps, an essential factor in the successful management of the cases.

Tyler Smith was probably the first to suggest the importance of affording rest to the stomach in the treatment of this affection, though in his case absolute abstinence from food was not practised.   At the time he first saw the patient, a woman, aged 19, of short stature, and "represented to have been plump and in good condition" previous to the commencement of her sickness, two months before, she had so emaciated that she weighed but forty-seven and a half pounds.[1]   He discarded all medication, and ordered one teaspoonful of milk and beef-tea to be given, alternately, every half hour.   He insisted that it is "difficult or impossible for the stomach to reject a single teaspoonful of any bland, unirritating liquid, such as milk."   This affirmation is too absolute.   Cases occur in which the stomach will not tolerate anything, either solid or liquid.   Occasionally,

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[1] Tràns. Lond. Obstet. Soc., vol. i. p. 335.

when some simple article of food is for a time retained, it simply accumulates, and is finally expelled undigested.   Digestion seems to be suspended, or so disturbed that stomachal alimentation is impossible.

The nausea and vomiting of pregnancy are undoubtedly, in a vast majority of cases, reflex phenomena, but it is not improbable that occasional exceptions occur, and in a large proportion of, if not in all, the cases where these stomachic disturbances become serious and for a time uncontrollable, catarrhal conditions of the gastric mucous membrane are superadded.   The clinical history of cases of acute gastric catarrh and of cases of protracted and uncontrollable vomiting of pregnancy are very analogous.   Anorexia or a vitiated appetite, nausea, vomiting, thirst, epigastric oppression or pain, a saburral condition of the tongue, eructations of a glairy mucus, and despondency, are common to both affections.   In fact there is not a symptom, except such as may relate to the reproductive organs, belonging to either which may not be present in the other.   The most frequent cause of catarrh of the stomach is indigestion, due either to an indiscreet diet or to derangement of the digestive process.   Impoverishment of the blood disqualifies the gastric fluids, and the inanition of pregnancy, so frequently the precursor of the more serious stomachic disturbances, may thus become a potential factor in their causation.   This, however, was not so in the case presented, for there was no previous history of inanition, stomachic disturbance, or impairment of health, and the symptoms were sudden in their onset, and undoubtedly due to fright occasioned by the unexpected intrusion of a drunken man into the dwelling of the patient.   Nevertheless, the subsequent history of the case establishes, presumptively at least, the presence of catarrh of the stomach, not however as the cause, but as the effect of the disturbance of the functions of the organ.

I am aware that in a majority of the post-mortem examinations of women who have died from this cause, no morbid condition of the stomach has been recognized, and that is true also of a majority of the cases of death from acute gastric catarrh.   "Post-mortem pallor of the mucous membrane (Wilson Fox) is no sign of the absence of previous inflammatory action."   This blanched condition may be due either to post-mortem contraction of the capillaries or to the action of the gastric juice.

"It is only," remarks Fox,[1] "when stasis has existed to an extreme degree, or when punctiform extravasation has taken place from the capillaries, that the signs of inflammatory hyperæmia persist long after death ; and even when present they seldom, except in cases of extensive inflammations from irritant poisons, occupy more than patches of the surface."

Notwithstanding the absence of macroscopic changes, Wilson Fox claims the presence of a condition corresponding to that of "cloudy swelling," which Virchow has demonstrated in the kidneys and livers of pregnant

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[1] Diseases of the Stomach, p. 133.

women. This he regards as the most characteristic appearance of catar-
rhal inflammation of the stomach, and he maintains, furthermore, that it
arrests the "normal secretion of the gastric juice," and at the same time
produces "a considerable amount of tenacious alkaline mucus."

In the case before us, the circumstance that fright in one instance pro-
duced uterine contractions, and in the subsequent pregnancy, at about the
same period of gestation, excited reflex phenomena which culminated in
such serious disturbance of the stomach, introduces the questionable influ-
ence of emotion as an exciting cause of the gastric disturbance.[1] Vomit-
ing is a frequent complication of parturition, and difficult or depraved
digestion, nausea and vomiting are not unusual co-attendants upon inflam-
matory conditions and malpositions of the uterus. When occurring du-
ring labor, the vomiting is probably always either reflex or emotional.
When uterine ailments are complicated by stomachic disturbances, sooner
or later inanition, too persistent to be ascribed to functional derangement,
becomes associated. Sympathetic disturbances of the functions of respi-
ration, circulation, and digestion, which control assimilation and nutrition,
when long continued, seriously impair the general health and cause struc-
tural alterations. For a long time nervous vomiting has found a place
among the numerous complaints of women, for the cure of which Sem-
mola[2] has so successfully applied electricity, as Thomas[3] and Lente had,
with equal success, to the treatment of the uncontrollable vomiting of
pregnancy. The suggestion that this complication of pregnancy may be
dependent upon structural alterations of the stomach is contradicted by
the speedy efficacy of this agent in these allied affections, as likewise by
the favourable result in instances of evacuation of the uterus, though un-
fortunately when artificially induced, death has followed in a majority of
such cases.

It is not, however, my purpose to prove that gastric catarrh is a neces-
sary cause of the nausea and vomiting of pregnancy, but to show its proba-
ble coexistence with these conditions when protracted, in order to estab-
lish upon pathological and therapeutic principles the correctness of the
prohibition of stomachal alimentation as a remedial resource.[4]

[1] Cases have been reported by Andral, Hoffmann, Bassius, and Barry.
[2] Practitioner, July, 1878, p. 61.   [3] Medical Record, 1878.
[4] Since this paper was delivered to the editor, Dr. H. F. Campbell of Georgia has
read before the American Gynæcological Society a paper entitled "Rectal Alimenta-
tion in the Nausea and Inanition of Pregnancy," which will appear in the third
volume of the Transactions of that Society. This paper relates more especially to
the physiology of rectal alimentation, and incidentally to its value as a substitute for
stomachal alimentation and medication in the management of the nausea and inani-
tion of pregnancy; thus, practically, affirming the same view which I, looking at it
from a different standpoint, have termed the prohibition of stomachal alimentation.
Dr. C. seeks to establish the efficiency of nutrient enemata as the remedial resource,
while I ascribe the benefit to suspension of the function of the stomach, while at the
same time employing nutrient and stimulating enemata. In his study of the physio-

The study of these phenomena involves the consideration of the exciting causes and of the associated pathological conditions.[1] Various theories have been offered in explanation. Sympathy with the uterus; congestive inflammation and great tenderness of the os and cervix in the latter months; some irritable conditions of the cervix; ulceration of the cervix; morbid irritation of the uterus, and inflammation of the deciduous membrane; distension and evolution of the uterine fibre or pelvic irritation; displacements and flexions of the uterus;[2] compression of the tissues of the uterus; absence of liquor amnii, allowing contact of the foetus with the uterine walls; inanition, and gastric catarrh have all had their advocates, but no one of these hypotheses can be accepted as sufficient. In our case the conditions were associated with fright and extreme hyperæsthesia of the vulvo-vaginal canal as co-operating causes.

Article XV.

Supra-pubic Lithotomy; with the History of One Successful Case. By Geo. W. Rachel, M.D., New York.

The method of extracting a stone through an opening above the os pubis has of late found an ardent and able advocate in this country—Dr. C. H. Dulles, of Philadelphia. Since 1875 this gentleman has published several interesting articles on this subject, in all of which, I think, he has satisfactorily proven the preferability of the operation in question to that by perineal section. The following history will serve to give occasion for a few remarks on the subject, partly confirmatory of, and partly differing from, the views held by Dr. Dulles.

J. D., not quite five years old, was first presented at Prof. Jacobi's Clinic for Diseases of Children, College of Physicians and Surgeons, on August 14. His parents gave a history of bladder trouble, dating back at least two years. He had been examined for stone by several surgeons, but none had ever been found. For the last two months the boy's distress was intense; he was only able to pass a very few drops of urine at a time, and his agony before he could pass any quantity worthy of mention would last for fifteen or twenty minutes, sometimes even half an hour. His parents were extremely anxious to find relief for him as soon as possible.

No suitable instrument being at hand, I ordered him to come to my

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logical action of rectal alimentation, it is probable that Dr. Campbell has, in a measure, been anticipated by Dr. Robert Battey of Rome, Georgia, who submitted to the Surgical Section of the American Medical Association, at the meeting at Buffalo, a paper entitled "Permeability of the Entire Alimentary Tract by Enema, with some of its Surgical Applications," a synopsis of which was published in the October No. (1878, p. 551) of the *Virginia Medical Monthly*.

[1] Monro, Obsts. Trans. Edinb., vol. iii. p. 94.　　　　　　　　[2] Ibid.

office. He came there on the 16th, and, after having put him under the influence of chloroform—a task that proved rather unpleasant for reasons to be hereafter stated—I introduced a steel bougie, No. 7, English scale. As soon as the point had reached the neck of the bladder, and before I had fairly begun to execute the upward and downward curve necessary to complete the introduction of a sound into the bladder, I felt the stone grating at the tip of the sound; the scratchy feeling was experienced while the sound was pushed further in, although indistinct, and was gradually lost. Dr. Lilienthal, who happened to be present, also convinced himself of the presence of a stone; the conclusion drawn about its situation was this, that very probably it was partially lodged in the prostatic portion of the urethra, just at the neck of the bladder.

On the 21st of August all the gentlemen connected with our Clinic, except Dr. Jacobi, who was absent from the city, convinced themselves of the presence of a stone in the boy's bladder. Again it was found that the tip of the sound grated upon the stone just as the hand commenced to turn it from its first position during introduction into that which is obtained after the completion of such introduction.. On the 27th of August, I extracted the stone in the presence of Drs. Gerster and Huber, of this city, and Dr. Dulles, of Philadelphia.

The anæsthetic used on this occasion was ether, because, as alluded to above, the chloroform narcosis asphyxiated the boy in the most alarming manner. Only by grasping his feet, and inverting his whole body, and by resorting to artificial respiration, could I succeed in resuscitating him. But the action of ether proved similarly disagreeable. As soon as Dr. Gerster, who was kind enough to take charge of the anæsthesia, gave the boy a dose sufficient to produce full narcosis, he became thoroughly cyanotic, with gasping respiration, and all the other signs of incipient asphyxia. The doctor was therefore absolutely unable to put the child fully under the influence of the drug; a semi-narcosis only was safely admissible. This was a difficulty I had to contend with during the operation, as we were not able to control his movements sufficiently. The bladder, before the operation, was washed out, by means of a double catheter, with carbolic acid, $1\frac{1}{2}$ per cent. solution, and then moderately filled with the same. The catheter was then withdrawn, and a steel bougie No. 9, introduced, of which Dr. Dulles, who advised its introduction, took charge with his left hand. I then proceeded to operate, beginning with a pretty free external incision ($2\frac{1}{2}$ inches). After the bladder had been exposed, Dr. Dulles took hold of it with a good tenaculum, and depressed the steel bougie in his left hand so that its point showed itself plainly bulging up the anterior wall of the bladder. I then made the incision into the bladder, and immediately followed the knife with my left index finger, insinuating it into the opening so that only very little fluid escaped. As soon as I had thus prevented the bladder from collapsing I felt the stone whirling up against the tip of my finger. Without using any instrument, by a little manipulation I brought the stone out without the slightest difficulty. The peritoneum was not seen; hemorrhage was trifling.

The external wound was not a very neat one, in consequence of the restlessness of the boy, which made it impossible to keep exactly in the median line. It was closed by seven strong silk sutures. The vesical wound was not closed, but a double drainage-tube was inserted, such as first used by Trendelenberg, as I intended to try the abdominal position, first suggested and carried out by him. A small drainage-tube was also left in

the external wound at its lower angle.   The wound was dressed with cotton batting saturated with carbolic solution, which was poured on half-hourly. The reaction on the first day was considerable : $105°$ F. in the morning, but only $101\frac{1}{2}°$ in the evening ; next day, $102°$, but after this normal.   To keep the boy in Trendelenburg's position proved an impossibility ; in the first place, he would always, instead of lying so that the wound was between the two hair-cushions and over the vessel placed there, move upwards, so that the wound pressed against the upper cushion ; and secondly, he would try to rise and turn himself on his back entirely.   I therefore removed the tube from the bladder and put him on his back with the injunction to change off to either side as little as possible.   On account of his pain and his restlessness, as well as to retard his bowels, I gave him tincture of opium 10 drops every four hours, and it acted as I have seen it act very frequently, although I do not recollect having seen the action mentioned anywhere else ; it stimulated his appetite into complete voraciousness !   Everything went on satisfactorily ; on the third day the first urine escaped through the urethra, while on the eleventh day, at 3 P. M., he urinated in a full stream, missing the vessel his mother brought to the bedside, and flooding the middle of the room with the contents of his bladder.   On the twenty-first day the wound closed, and the boy is in excellent condition at present.

The stone is a uric acid calculus weighing 44 grains.   It is biscuit-shaped and one inch long.   The constriction separating the two portions, however, is not in the middle, the length of one portion being $3'''$ (and $4'''$ broad), while that of the other is $9'''$ (and $7'''$ broad).   This peculiar shape is in accordance with the fact that the stone was located at the neck of the bladder.   The probabilities are that the smaller portion occupied the neck and the prostatic portion of the urethra, while the larger extended back into the bladder, occupying its base, the strongest fibres of the sphincter by their contraction prohibiting a free deposit, thereby producing the deep indentation ($2\frac{1}{2}'''$ diam.).   The fact that the boy, during the last months, suffered terribly—incomparably more than during the preceding years—also supports this view.   He was sometimes in great agony for thirty or forty minutes before he could pass his water, which, during the last months, always came in drops and never in a continuous stream.

I must, however, mention the fact that a stone of very similar shape, only twice as large, which I saw while looking up the different collections in this city, seems to a certain extent to contradict my theory in regard to the origin of this peculiar shape.   It is the calculus No. 796 in the New York Hospital Museum, to which specimen there is a record in the printed catalogue (page 315), prepared twenty years ago by the late Dr. Robert Ray, Jr.   There the stone is rightly described as " of an hour-glass form," and it is reported that " lateral perineal operation was performed and a great deal of difficulty experienced in extracting the stone, as it was partially encysted upon the anterior wall of the bladder and so tightly constricted that a knife had to be used to liberate it."   I am sorry that this report does not state which portion of the stone was encysted, although I think that even the smaller is too large to have been lodged in the neck of the bladder ; and, furthermore, if the latter would really have been the case, we should have certainly found it so stated in the report.

I have found, however, still another specimen in the same cabinet, which strongly supports my theory. The number of this specimen is 793, and its description (page 314) is given as follows: "The stone (which weighs 1 oz. 6 dr.) is somewhat oval in shape, and its section is beautifully marked by concentric lines of different colors. *The nipple-like process seen at one end projected into the neck of the bladder, while the concave curve behind it rested upon the bas-fond.*" This nipple-like process very much resembles the smaller portion of the calculus extracted by me; the fact that it is larger finds its explanation in the circumstance that the specimen was removed from the bladder of a man of 18 years.

I have dwelt on this point somewhat longer than might seem called for, because in two meetings of two different bodies of medical men I have encountered opposition in regard to my theory of the origin of this peculiar and rare form of calculus. The principal objection raised by several able colleagues was that the stone could not possibly have remained at the neck of the bladder, as it would then have been utterly impossible for the boy to pass water. The case from which specimen No. 793 has been derived does, I think, invalidate this objection.

In conclusion, I wish to say a few words about some details of the operation as well as about its merits in general. In regard to the preparatory treatment of the bladder, I would say that the best way seems to be the following: *Wash out the organ* with a lukewarm solution of carbolic acid (1 to 2 per cent.) by means of a double catheter and a syringe. As soon as this is done, fill it moderately, ascertaining its position by percussion, *and then withdraw the catheter*, *substituting for it a steel sound*, or, if this is possible, *i. e.*, if the urine is retained in consequence of the chloroform narcosis, *do not introduce anything at all per urethram.* This was done in another case operated upon by me, which forms the basis of an article by Dr. Dulles in the April number of the *American Journal of the Medical Sciences.* I fail to see the reason why Dr. Dulles in this article condemns the use of the double catheter, which he advised in his first paper on the subject. He does not give any, as far as I can see, and did not object to its use at the operation herein described.

The integumentary *incision* should be a *large* one, as should also that made in the bladder. In the perineum, of course, the surgeon is desirous to make the wound as small as is feasible, since slow twisting, working, and pulling will often bring out a stone through an opening originally apparently much too small for the purpose. This is not necessary here. The larger the incision the quicker and the easier is the extraction consummated. The danger of infiltration—of which more anon—is thereby hardly increased, if at all; the danger of cutting the peritoneum is, however, lessened, and for this reason: the higher up the incision is prolonged, the more likelihood will there be to reach the peritoneum by careful dissection, and when seeing it, trust it to a reliable assistant to keep it out of

your way. The simple rule is that you only wound the peritoneum when it is hidden in the upper edge of the wound; find it, and you will not wound it. This rule, of course, applies more to adults, as the peritoneum in children covers much less of the anterior surface of the bladder than it does in the former. Lastly, the incision preferable in adults is the one parallel to the os pubis, and this may also be made pretty free without especial danger to the peritoneum on either side.

The cut into the bladder as first practised by Gunther is, according to my experience, the quickest, and at the same time the safest. Although Dr. Dulles makes it a special point that the bladder should be secured with a good tenaculum, and the point of the sound should be raised, and on it the incision commenced, I have the impression that it is just as safe to follow up the incision with the left forefinger. The latter (and not the stone) blocks the opening and prevents the escape of the fluid and the collapse of the organ. But even if the incision should be so large, that the fluid would find its way out, the finger in the bladder would suffice to prevent its complete collapse, and it could never be lost so as to cause serious embarrassment. Indeed, to my mind this feature of the operation illustrates better than any other its grand simplicity. No sound, no tenaculum, no stone-forceps: the finger—*the best instrument*—taking their place, and taking it successfully!

But, even if the finger, for some reason, should fail to extract the stone —although every calculus not too large and not encysted must and will be whirled up against the operator's finger—the secondary introduction of a stone-forceps or Günther's stone-spoon is a matter of little or no difficulty.

As regards after-treatment, I would say that the question, whether *to sew up the wound or not*, is still an open one. Günther, it is true, has had excellent results as compared with all previous statistics, perineal and supra-pubic, while leaving the wound absolutely untouched after the extraction of the stone. Yet, I am aware that several surgeons, among them Lotzbeck, Bruns, and Starr, during the last few years, have successfully sewed up the wound tightly, bladder and all, in one contiguous Lambert suture. I think that a surgeon thoroughly experienced in Lister's antiseptic treatment is fully justified in closing the wound in the bladder with cat-gut, and the external wound with an antiseptic silk suture.

As to *injections* after the operation to remove plugs of pus, mucus, and clots, I think they are justly condemned by Dr. Dulles, because they always require a gentle force, and even the gentlest under the circumstances is an undue force. Even when the wound is not closed by sutures, but left entirely to itself, I would advise against their use.

Catheterizing is necessary when the wound is tightly closed; otherwise it is superfluous, and the urine flowing over the wound does little harm, if any, because it has no time to decompose.

Warm baths, frequently repeated, have found an able and persistent ad-

vocate in Günther. I cannot say much about them, except that they may perhaps retard the agglutination of the tissues in the healing process, and as patients under equal conditions get well with, just as well as without them, I would not insist upon their use. Besides, they require considerable moving and handling of the patient, which perhaps might just as well be spared him; for the efforts which he involuntarily makes, when lifted, etc., always tend to contract his abdominal muscles, a thing specially to be avoided. A dose of opium, regularly continued, is a good preventive of the evil tendency just described, to which children by their natural vivacity are peculiarly liable.

A rapid survey of the advantages of the supra-pubic method recalls the following points :—

1. *A ridiculously small armamentarium.* (In average cases a pocket-case suffices.)

2. *Easy approach to the interior of the organ.* (A large wound, not a deep wound.)

3. *Easy apprehension of the calculus.* (No groping in the dark.)

4. *Easy extraction of the same.* (No pulling, tearing, twisting, dilating, lacerating, etc.)

5. *No destruction of important organs.* (No impotence, no sloughing of rectum, etc.)

6. *No hemorrhages* (neither during nor after the operation; only 2 out of over 500 cases on record, neither of which was fatal).

7. *No fistulæ* (of whatever description). It might be added that this is the only method of lithotomy where Lister's dressing may be fully applied, if the wound is sewed up (see above).

I think that these numerous advantages, almost every one of them a vital one, more than counterbalance the few disadvantages of this method that are again and again urged by its opponents, although having again and again been proved to have been always overrated.

I would like to divide these according to the stage of the operation in which they happen. During the operation there is a possibility of (1) *Protrusion of intestines*, and of (2) *Cutting into the peritoneum*. After the operation you have to fear (what just as frequently happens after perineal section), (1) *Peritonitis* and (2) *Urinary infiltration*. Dr. Dulles has shown that the fear of all this is, for the most part, imaginary. Of over 500 cases there was—

Protrusion of intestines in 13 cases, and of these 3 died.
Cutting of peritoneum in 14 "   "   4 "

And furthermore—

General fatal peritonitis in 6 "
Urinary (fatal) infiltration in 7 "

I think that a careful perusal of this short review of the salient points *pro* and *con* in the discussion, concerning the merits of the "high opera-

tion,'' may perhaps encourage some of our readers to give this method a trial. All the advantages urged for the median operation are equally present in the supra-pubic. In children, at all events, this method is, it seems to me, *the* operation. Of recent operations, the one successfully performed by Dr. Starr, on a man weighing 200 pounds, a description and analysis of which Dr. Dulles gave in the *Amer. Journ. of the Med. Sciences* for July, 1877, is, I think, typical. The time is at hand in which such cases ought to be operated above the pubes *from the start, and not only after extraction through the perineum has failed*. Supra-pubic lithotomy is no "dernier ressort;" it is a first-rate operation, and ought to be recognized as such.

ARTICLE XVI.

ON FRACTURES AT THE LOWER END OF THE RADIUS. By JOHN H. PACKARD, M.D., Surgeon to the Episcopal Hospital, Philadelphia, Pa. (Read before the Surgical Section of the American Medical Association, at Buffalo, 1878.)

MORE than one hundred years ago, the distinguished French surgeon Pouteau wrote that fractures of the radius in the vicinity of the wrist, caused by falls on the hand, " are generally mistaken for sprains, for incomplete luxations, or for separations between the ulna and radius.'' This statement, which contains the germ of the modern ideas on this subject, seems to have had no influence at the time, and to have come to light again only as a matter of history.

In 1814 Colles, of Dublin, published in the *Edinburgh Medical and Surgical Journal* so clear and philosophical an account of these fractures as to have held its own, with scarcely any important modification, to the present day. His very modest article, however, attracted but little attention until brought into notice and enlarged upon by Mr. Robert W. Smith, also of Dublin.

Dupuytren followed, in a paper of uncertain date, but expressing views which must have been developed between 1819 and 1829. He was either unaware of Colles's publication, or chose to ignore it. What is still more remarkable is, that in 1847, Malgaigne, a very scholarly and comprehensive reader, and better acquainted than most of his countrymen with foreign books and journals, also passes over in silence the fact that Colles had written on the subject. Neither Voillemier nor Nélaton make any reference to it. These facts, however, need not surprise us so much when we note that Sir Astley Cooper makes no mention of Colles's name, and that it is barely alluded to by Fergusson. A long list of other names might be quoted did space permit.

The first American publication on the subject was by Dr. John Rhea Barton, of Philadelphia, in the *Medical Examiner* for 1838. His views were wholly theoretical, and have never yet, in forty years, been verified by dissection in this country. After him (excluding articles contained in systematic works on surgery, and that in Hamilton's *Treatise on Fractures and Dislocations*), no one dealt at any length with this topic until 1870, when Dr. E. M. Moore, of Rochester, N. Y., in the *Transactions of the New York State Medical Society*, published a paper urging the importance of the displacement of the ulna as an element of the injuries in question. In 1874 this was followed by an able prize essay from the pen of Dr. Thomas K. Cruse, of New York, in the *Transactions* of the same society. Lastly, Dr. Pilcher, of Brooklyn, in the *Transactions of the Medical Society of the County of Kings* for March, 1878, has discussed the matter, with some interesting practical and experimental details. Besides these four essays, I cannot at present (June, 1878) refer to any by American authors.

But neither the extensive foreign literature, nor the meagre list of writings by surgeons of this country, on the subject of fractures at the lower end of the radius, have placed it beyond discussion; and I therefore trust that no apology will be needed for offering some considerations in reference to it.

As to the lesions met with, it may be stated that in the great majority of cases *the principal line of fracture is more or less transverse*, and that when the fracture enters the joint it is generally by comminution of the lower fragment.

This statement is borne out by the study of museum specimens, and of recent dissections, as well as by clinical observation.

Again, we find that as a rule *the displacement of the lower fragment is a tilting up backwards*, so that the posterior edge of the upper fragment tends to run obliquely into the cancellous structure of the former, and the articulating surface is slanted backwards at an angle with the normal axis of the bone.

Sometimes there is a displacement backwards, with a very slight degree indeed of this tilting; the lower fragment being rotated slightly at its outer side, while the ulnar side is held fast by its connections with the ulna.

On this matter the testimony of museum preparations, and especially of old united fractures, is not always to be accepted without very careful study; since changes may have taken place in the way of deposits of new bone, and of absorption of fragments in the process of union, and in the later process of modelling, such as to wholly efface the characters of the original injury. Rigid scrutiny should also be bestowed upon clinical cases, since the difficulty of accurately making out the line or lines of fracture is sometimes very great, especially when the swelling of the soft parts

is such as to mask the bone. And in old cases, for obvious reasons, it is very hard to arrive at a satisfactory degree of certainty in regard to the exact lesion which may have existed.

Making allowance, however, for possible errors, we have enough assurance of these facts to draw from them the inference that *the great majority of these fractures are produced by leverage.* Additional testimony to the truth of this statement is derived from another source.

Sir A. Cooper, in 1833, made experiments on the dead body, carrying the hand back into extreme extension; the radius gave way, in one instance at the epiphysis, in the other just above that point. These experiments have been often repeated, by Voillemier, by Gordon of Belfast, by Cruse, by Pilcher, by myself, and very probably by others, always with the same general result.

Another method, adopted by Nélaton, Le Comte, and others, is to place the palm of the hand on a firm surface, and to strike heavy blows upon the elbow, or upon the sawn ends of the bones. In 1864 I made fourteen trials of this method, and in all obtained a transverse fracture, with comminution of the lower fragment.

The very great frequency of this transverse fracture, produced by falls on the hand, demands some other explanation than the impact of the carpal bones against the extremity of the radius. And such an explanation is found in leverage. Perhaps, however, the best expression for the mechanism of the injury is that borrowed by Gordon from another branch of science, " cross-breaking strain."

Pilcher, in the essay before mentioned, points out the fact that by a fall on the palm of the hand we may have various grades of injury produced, according to the severity of the force brought to bear upon the structures about the wrist. The ligaments and accessory fibrous tissues may be stretched and torn, constituting a sprain. To this may be added bruising or even fissuring of the bone, which, by a still greater force, would be carried to actual fracture. If the upper fragment is driven down into the lower, the latter may be comminuted in various degrees.

Here it may be mentioned that in this comminution of the lower fragment its posterior or dorsal portion is almost invariably involved.

When a man falls forward, alighting on the palm of his hand, the hand is pronated and extended to the utmost degree; the ligament and tendons at the palmar surface of the joint are stretched, and as the elbow is driven on by the momentum of the body, the leverage exerted comes on the bone, the palmar wall gives way, then the cancellous columns in succession, and then the dorsal wall.

If we notice a boy in the street, or a circus-actor, turning a hand-spring, we see that he puts his hands down everted and apart, so that the degree of extension at the wrist is limited, and his weight is really thrown directly along the axis of the radius, and through it upon the arch of the carpal bones.

I have been unable to find an account of any case in which fracture of the lower end of the radius has been ascribed to a fall with the hand on a line with the forearm.

Seven cases are on record of displacement of the lower fragment anteriorly, or tilting towards the palmar face. Three of these were seen by Callender,[1] one during life, with a clear history of extreme flexion of the hand at the time of injury. The other two were museum specimens. R. W. Smith gives a fourth, Hamilton a fifth, and there are two in the Museum of the New York Hospital, one of the latter being a cast and the other a dried specimen.

One specimen in the New York Hospital Museum seems to me strongly confirmatory of this view in regard to the production of these fractures by pure leverage. The fracture has not been quite complete; a splinter still connecting the lower fragment with the upper, but bent, as if ready to give way to further force.

It must be allowed, however, that there are cases which do not admit of this explanation. Such are the "stellate cracks," of which three are preserved in the Warren Museum, in Boston. In one of these, figured by Hamilton, a fissure extends (in the cut), about $1\frac{1}{2}$ inch along the shaft.

Another lesion, difficult to account for except on the theory of direct violence, consists of a separation of a small portion of the lower extremity, the articular facet for the ulna being broken off from the rest of the bone. The explanation above suggested is favoured by the statement that one of the carpal bones is also broken. (N. Y. Hospital Museum, No. 128.)

Fractures are also met with by which the styloid process is broken off, an oblique line running into the joint. An excellent instance of this is in the Warren Museum in Boston, No. 4631. Callender mentions two London specimens. Hamilton thinks he has twice made out a fracture of this kind in the living subject; and many others of less authority as observers have claimed to have often seen such.[2]

In one case (N. Y. Hospital Museum, No. 127), and in a number of others, the styloid process is broken off, and the posterior lip of the articular end is also separated.

This leads us to ask whether there is such a fracture as that described by Barton and called by his name. This gentleman (*Philada. Med. Examiner*, 1838) says, that in the act of falling "the hand is instinctively thrown out, and the force of the fall is first met by the palm of the hand, which is violently bent backward until the bones of the wrist are

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[1] St. Bartholomew's Hospital Reports, 1865.

[2] The case reported by Dr. Butler (*N. Y. Journal of Medicine*, 1867), in which a boy of 14 had the styloid process broken off and drawn upwards an inch and a half, is, I believe, entirely unique. The boy had fallen from a height of thirty feet; there was also a transverse fracture higher up. Union took place with the fragment in its abnormal position.

driven against the dorsal edge of the articulating surface of the radius, which, being unable to resist, gives way. A fragment is thus broken off from the margin of the articular surface of this bone, and is carried up before the carpal bones and rested upon the dorsal surface of the radius; they having been forced from their position, either by the violence or by the contraction of the muscles alone." He draws a distinction between this fracture and that described by Colles, whom, however, he does not mention.

Again, he says : " It sometimes happens, also, though rarely, that fracture of a similar character to the one just described occurs *on the palmar side* of the radius, from the application of force against the back of the hand while it is bent forwards to its ultimate degree."

One specified case only has been put on record of a lesion of this kind, but it does not appear that it was verified by dissection. Voillemier (*Arch. Gén.*, 1839) quotes it from Lenoir.[1]

Now, it seems to me clear that the greater the extension of the hand, the less the force brought to bear against the dorsal lip of the articulating surface of the radius. Moreover, the rounded shape of the proximal joint surface of the upper row of carpal bones would *a priori* exclude the idea of their having the wedge-like effect ascribed to them.

Still less possible would it be for force applied to the back of the hand during extreme flexion to produce an analogous chipping off of the palmar lip of the articulating surface of the radius.

It was before noted that in most cases of comminution of the carpal fragment the dorsal portion of it suffered. Such has been the case in every specimen of which I have knowledge ; and I believe it may explain partly the origin of Dr. Barton's idea.

Here let me express my entire concurrence in the opinion stated by Callender, Pilcher, Cruse, and perhaps others, that the cause of comminution of the lower fragment is the driving into it of the lower end of the upper. Thus, Callender says, " Of nineteen of the fractures of the end of the radius which have been referred to, seventeen extend into the wrist, three of these from general crushing of the lower extremity of the radius, fourteen from splitting of the carpal end through the wedging in of the proximal portion of the shaft."

Taking now the leverage theory of the production of the transverse fracture, it is easy to see why the posterior portion of the lower fragment is sure to suffer in the comminution. And we have only to go a step farther to see how, examining only the living subject, Barton found his view borne out. Granting that he detected a fragment carried up upon the dorsal surface of the radius, before the carpal bones, it is probable that this piece was only one of several constituting the lower fragment, separated by a

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[1] This particular year (1833) is wanting from the only set of the *Thèses Inaug.* to which I have access.

transverse breakage. Such a fracture as this could not justly be claimed as that described by Barton, since he expressly says that " the end of the radius itself occasions on the palmar side a prominence which is round and smooth, and differing in this from similar projections formed by the fractured ends of bones." Nor can fractures separating the styloid process with more or less of the adjacent bone be regarded as conforming to his description.

I must confess, moreover, my inability to see how, from a fracture merely of the posterior lip of the articular extremity of the radius, treated with ordinary skill or care, such bad results could ensue as Barton enumerates : " A crooked arm, deformities, rigid joints, inflexible fingers, loss of the pronating and supinating motions."

And although the views of this able surgeon have commanded so much respect in Philadelphia, and among those taught in the schools of that city, as to give a certain currency to the term " Barton's fracture," yet not a single specimen of it exists, nor has any one except the French writer before referred to stated positively any definite case in which it was even supposed to be detected. Barton himself never verified his theory by dissection. True, the lesion is not a fatal one, but neither is Colles's fracture, of which so many specimens can be shown.

I feel constrained, therefore, to express my belief that the views set forth by Barton as to fractures of the lower end of the radius are unsupported by facts. If such facts are attainable, they have eluded my search carried on for the past twenty years.

My endeavour so far has been to show that, with very rare exceptions, fracture of the radius at its lower extremity takes place by leverage, or, in the technical language of mechanics, by " cross-breaking strain." Perhaps it will not be regarded as too great a refinement, if I object to the terms " tearing off" or " avulsion" sometimes used even by those who accept in the main this theory.

The action of the ligament which is first stretched, and which finally causes the bone to give way, is like that of a rope attached to a bar, and pulled upon across the axis of the latter. The whole force is applied at an angle to the axis of the bone.

The symptoms of the injury in question need not occupy us very long.

First, concerning impaction, we find very opposite views expressed. Gordon says that in Colles's fracture it is impossible. Callender says that thirty-six specimens in the various museums in London show deformity, in all clearly due to " the impaction of the proximal into the distal end of the bone." Voillemier thought the impaction so marked a feature of the injury, that he would rank it among what he calls " fractures by penetration." R. W. Smith argues that the appearances which led Voillemier to this opinion were due to deposits of new bone.

With this question as to impaction is closely involved another, as to

preternatural mobility.   In proportion to the closeness of interlocking of the fragments will this symptom be difficult to detect.   Another circumstance tending to obscure it will be the nearness of the fracture to the wrist-joint.   When it exists, I believe it generally, if not invariably, indicates comminution, and should prepare us for difficulties in treatment. When it is not readily felt, any attempt to develop it is rash, cruel, and unwarrantable.   The other symptoms amply suffice, and if the fragments can be so moved upon one another as to effect reduction, the question can and will be settled when this procedure is undertaken.

It cannot be denied that many museum specimens show no impaction, but these are such as have been removed and cleaned from recent cases, in which no union has as yet taken place.   Probably if examined carefully when fresh, with reference to this point, as were some of those mentioned by Callender, they would have told a different story.   Certainly the irregularities of breakage noticeable in many of them, and the known difficulty of reduction in these cases generally, unless comminution has occurred, afford strong ground for believing that entanglement is the rule.

The deformity is perhaps kept up in great measure, as suggested by Pilcher, by the untorn periosteum stretched between the fragments on their dorsal surfaces, as well as by the portion of the anterior ligament passing obliquely from the styloid process of the ulna to the cuneiform bone.   But these, it seems to me, can only have the influence attributed to them by reason of their agency in preventing the disengagement of the interlocked fragments.

Undoubtedly, however, the combined effect of the impaction and the tension of these fibrous structures is to prevent in many cases the occurrence of crepitus, and thus to mask what is too often thought an essential evidence of fracture.

Nothing need be said, in the way of description, of the deformity in these cases, since it has not only been often and thoroughly set forth, but is a matter of common observation with practical surgeons.

Let me, however, note that R. W. Smith and others regard the action of the muscles as the cause of the symptoms ; and Erichsen refers to a case dissected by him in proof of the correctness of this view.   That the tendency of the muscles would be to maintain it, cannot be doubted; the hand, at the moment of receipt of the injury, is pronated, while the fracturing force tends to twist the lower fragment up into supination.   The upper fragment would be held in pronation by the pronator teres, against which the supinator brevis would, perhaps, not exert any efficient counteraction.   But the pronator quadratus is probably, in many instances, as in several mentioned by Callender, so torn, and so separated from its radial connections, as to be powerless.

In cases where the lower fragment is not comminuted, I believe that the accurate adjustment of the fragments, and their retention in this rela

tion, suffice to overcome any muscular force which would tend to their displacement, and this is of great importance in the matter of treatment.

Mention has been made of the views of Dr. Moore, of Rochester, as to the ulnar displacement, which he would rank as the principal lesion. Upon careful examination of his paper, I find it impossible to look upon this idea as a tenable one in regard to the majority of these fractures. I cannot but consider the luxation of the ulna as a mere symptom, and not a very constant one; although it may be admitted that when it exists, it calls for careful attention. But this will be again referred to in connection with treatment.

There is one constant symptom, which may be very important, as affording a ground of diagnosis between a mere sprain and a fracture; I refer to pain on pressure. Whenever, after a fall on the hand, with injury severe enough to call for surgical care, there is pain at a certain point in the bone near the wrist, so that as often as the fingers of the surgeon are passed along the bone and come to that spot the patient winces, there is reason to suspect fracture, even although there is no displacement or other sign. And I firmly believe that it is safer, for surgeon as well as for patient, to deal with such a case as if the bone were clearly perceived to be broken.

Finally, we have to consider the proper method of treating fractures at or near the wrist.

In regard to this very important matter, as well as to the amount of success which may be hoped for, authors have greatly differed. Some represent reduction as extremely difficult, in many cases impossible, while others look upon it as simple and easy of accomplishment. By some we are advised to put the whole forearm and hand in rigid confinement with splints and compresses; by others we are assured that circular constriction of the wrist only is needful. Some claim to obtain, as a rule, perfect cures; others assert that deformity and disability are left in almost all cases. Diversities of this kind certainly show that the subject will bear further discussion.

The general principles of the treatment of fractures must not be lost sight of here. Deformity, when it exists, should be remedied, and the fragments restored as exactly as possible to their normal relation. Means should next be applied to keep them efficiently supported until union has taken place. During the time required for this process, constant care should be given to prevent subsequent trouble, by the early institution of passive motion, by frictions, by keeping the skin in a healthy state, and by gradually restoring the freedom of the hand.

No matter what may be the issue of a case, if the surgeon has carefully and conscientiously carried out these cardinal rules, he will have nothing to reproach himself with. He cannot command success, but he will have deserved it.

1. As to reduction. Callender says, " in a great number of cases the impaction so fixes the fragments that they cannot be unlocked, and the deformity is permanent."

Colles, on the other hand, says, " If the surgeon lock his hand in that of the patient, and make extension, even with moderate force, he restores the limb to its natural form, but the distortion of the limb instantly returns on the extension being removed."

Sir A. Cooper thinks powerful extension is required, but that the deformity recurs the moment that it is relaxed.

Dr. Moore thinks that if the head of the ulna is disengaged from the annular ligament and tendon of the extensor carpi ulnaris, the whole difficulty is overcome.

Pilcher, ascribing the obstinacy of the displacement to the untorn periosteum on the dorsal surface, advises that the hand be carried backward.

Impaction, dislocation of ulna, dorsal periosteum, muscular contraction —reduction impossible, reduction easy, reduction easy but deformity at once recurrent—how are we to reconcile these opinions, or how choose between them ?

I cannot but believe that the truth will be found in recognizing the fact that cases differ. Sometimes the impaction will offer the main obstacle ; sometimes the tense dorsal periosteum ; sometimes obstinate muscular contraction, in which case complete anæsthesia will solve the problem.

Sometimes the luxation of the ulna will totally prevent the restoration of the radial fragment ; but as this is not present in all cases, nor even in a large proportion of them, I cannot think it can be looked upon as the usual cause of the difficulty of reduction of the fracture.

Sometimes the great bar to replacing the lower fragment is the want of purchase upon it. By extension applied to the hand, we only succeed in stretching the carpal ligaments, but do not really pull upon the bone. In these cases we must at the same time make extension, and try to apply pressure to the fragment, so as to rock it loose, as it were, from the surface against which it rests.

And although, as already said, the untorn dorsal periosteum does not seem to me to be always in fault, the practice based upon that idea by Pilcher does seem to me to be correct—to make extension with the hand bent backward as far as possible, so that the fragment may go back as it came. This, with the circumduction of the hand recommended by Moore, certainly holds out the best promise of success. During any manipulation of this kind, the patient should be fully etherized.

One word as to the cases in which the deformity recurred at once after removal by extension applied to the hand. I cannot but think that here the displacement was not really overcome, but only seemed to be so. The reasons for such a belief will probably suggest themselves at once ; the extension, bringing the fibrous tissues, dorsal and palmar, to bear upon the

lower fragment, would lessen the angle between it and the upper, and in a considerable degree restore the outline of the part. The real interlocking of the fragments, however, remaining unchanged, the deformity would at once recur in proportion to the slackening of the extension. Such an extension, even if kept up permanently, would utterly fail to give a good result.

When reduction of a fracture near the wrist has once been completely accomplished, by placing the hand in a position of extreme extension, and then drawing upon it so as to free the lower fragment, this manœuvre being accompanied if needful by circumduction of the hand, or by gentle manipulation of the fragment, the width of the surfaces placed in contact, their irregularities, and the pressure of the surrounding fibrous tissues, all tend to prevent any recurrence of the displacement.

The importance of complete reduction cannot be too strongly insisted upon. Until the fragments are accurately restored to their normal relation, it is useless to apply the best apparatus that could possibly be devised.

2. As to the retention of the fragments. Here again we meet with widely diverse teachings. I shall not undertake to enumerate all the splints that have been proposed, but would simply point out what it seems to me essential to do in order to obtain the best results, and how this can be best done. Let me say first of all, that one of the greatest mistakes that can be made is to think that the use of this or that splint is going to insure success.

Above all things let the surgeon in every case consider what are the requirements with which he has to deal, and adopt his measures accordingly. This only is scientific surgery; anything else is mere routinism.

Reduction having been effected, the forearm will be restored to its normal contour. Comparing which lines with a straight line, it is clear that if flat splints are used, they must be padded so that the surfaces applied to the palmar surface of the forearm shall correspond to the latter. And I think it will also be admitted by most surgeons that this is very seldom done; that the compresses employed are apt to be either too small or too soft. Another point which often, perhaps generally, has escaped notice is the difference, very marked in muscular adults, but plain even in the forearms of children, between the radial contour and the ulnar, so that the radial edge of the compress should be much thicker near the wrist than the ulnar.

The difficulty of arranging these compresses accurately, of getting them of the exact size, shape, and thickness required, and above all, of preventing them from either flattening down or shifting, must be recognized as a valid objection to their use.

Hamilton's plan of enveloping the splint in a loose sack, between which and the splint curled hair is inserted and shaped so as to form the com-

presses, is certainly the best and safest form in which mere padding can be employed.

Bond's splint, as generally used, merely lined with cotton, the hand bent up backward over a large palmar block, has no doubt been a most fruitful source of permanent deformity in these cases. The size and shape of the block renders stiffening of the fingers almost inevitable. To fit this splint for effective use, the palmar block should be cut away at either side so as to give it nearly the shape of half an egg; the leather sides should be removed, and on the upper surface of the splint itself, at the radial side, a piece of wood should be fastened, so shaped as to suit the normal concavity of that portion of the forearm.

Dorsal compresses, as well as dorsal splints, may as well be wholly dispensed with. They can do no good if the reduction of the fracture has not been thoroughly accomplished, and if it has, they are needless.

But the object aimed at in the use of compresses can, in my opinion, be much better effected by means of a properly shaped splint. That devised by Coover, of Harrisburg, Pa., has answered extremely well in my hands. The one proposed many years ago by Carr, of New Hampshire, has the great merit of being easily made with a few slips of wood and a piece of broomstick; but it seems to me to require some modification, the neck, if I may so call it, being too long, and the graduation in thickness being imperfect.

Whatever form of splint is employed, there may be great advantage, as union becomes firm, say about the second or third week, in cutting away the hand part, and leaving simply the support to the wrist.

For covering these splints, or any others which are accurately adapted to the surface, I think two layers of canton flannel, or of ordinary woollen flannel, greatly preferable to cotton, which is very apt to become sodden and lumpy with perspiration.

One important point may be mentioned in this connection. The same rule should be observed here as in other fractures—frequent examination and early passive motion. Malgaigne made the extraordinary statement that after dressing a fracture of this kind, his practice was to leave it undisturbed until the eighteenth or twenty-second day, when he would ascertain the condition of things, and remedy any displacement that might have occurred. In this era of suits for malpractice, such an example could hardly be safe to follow.

Much stress has been laid by some writers on the necessity of adduction of the hand, so as to force the ulna into its place, and prevent the lower fragment of the radius from riding up over the upper; and various devices, from pistol-shaped splints to the mere weight of the hand, have been resorted to under this idea. Nothing need be said of them, except that they are useless if the fracture has been completely reduced.

Lastly, we are told by Dr. Pilcher that we ought to abandon all splints

in the treatment of Colles's fracture, and content ourselves with a broad strip of adhesive plaster around the wrist. Dr. Moore advises merely a compress and bandage. Both these gentlemen claim to have achieved constant and perfect successes by no other means. Without pretending to cast a doubt upon their statements, I must confess that were my own wrist the seat of such an injury, I should be unwilling to trust such seemingly imperfect protection; and that before taking the chances of unpleasant results in practice, I would make very cautious experiments under such circumstances as would enable me at once to detect and repair the mischief which I should certainly dread.

As to the degree of success which may be looked for in the treatment of Colles's fracture, I can only say that there seems to be reason to believe that the average of results is better now than it was twenty years ago, and to hope that further improvement is in progress.

Nothing must satisfy us, in this or any other department of practice, short of the very best attainable results. If we can get, in addition to the usefulness of the limb, which Nature generally manages, a complete restoration of form, we ought not to be content unless we use the means, the care, and the skill, which will secure this advantage to our patients. Nor should this standard be adopted only for certain cases where deformity would be especially mortifying to its subject and discreditable to the surgeon; it should be aimed at invariably, in hospital practice as well as in private, in the poor as well as in the rich.

ARTICLE XVII.

A CASE OF CHOLECYSTOTOMY, WITH REMARKS.   By W. W. KEEN, M.D.,
Surgeon to St. Mary's Hospital, Philadelphia.

FOR the following history I am indebted to Drs. Bonifil and Ewing, the Resident Physicians of the Hospital, and to the courtesy of my medical colleague, Dr. James Simpson, for permission to use it.

Mary H., æt. 60, Irish, married, has had six children, was admitted to St. Mary's Hospital, service of Dr. Simpson, October 16, 1878. Her general health had always been good until six months ago, when she began to have a dull, aching pain in the back, between the shoulders and in the left hypochondriac region. This continued for about two months, when she began to have a sharp, shooting pain in the right hypochondriac region, loss of appetite, vomiting, constipation of the bowels, and in a short time became jaundiced. The vomiting continued quite constantly for six or seven weeks. The jaundice became deeper, appetite continued poor, and bowels constipated, vomiting frequent, stools clay coloured, and urine darkly coloured, until admitted to the hospital.

Present condition (October 16th.)—Emaciated, intensely jaundiced,

almost mahogany coloured, and has a worn, pinched expression. Suffers from a dull, occasionally shooting pain in the right hypochondriac region, and sometimes in the left side and back. She has no appetite, and can take no solid food without vomiting; can take milk better, but sometimes vomits that; bowels constipated, and, when opened, the stools are clay coloured. The urine is very dark. Suffers very greatly from itching all over the body, but not enough to prevent good sleep. Everything she looks at is tinged with green. A white shirt bosom especially is quite green to her eye.

The liver is somewhat enlarged, and lower than usual, the dulness extending from the seventh rib to two inches below the border of the ribs, and below it can be felt a soft fluctuating mass, globular in form, about 4 or 4½ inches in diameter, reaching to about half an inch above a line drawn across the abdomen from the crest of the ilium.

Treatment.—R. Sodii bicarbonat. gr. iv, Acid. tartaric. gr. iv, every three hours.

17th. Vomits less frequently.

18th. The tumour has enlarged perceptibly, and is now about 5 inches in diameter. A hypodermic syringe was used as an aspirator, and ℥ss of dark fluid drawn from the tumour. Nitric acid shows that it contains bile. Suffered much pain after the aspiration. Morph. sulph. gr. ¼, hypodermically.

19th. Suffers still a good deal of pain when the hypodermic point was passed, and there is slight tenderness on pressure.

20th. Pain better. Bowels opened, and the stool found to be dark greenish, watery, somewhat resembling tea.

21st. No pain; feels more comfortable. Stool dark and more natural.

26th. To date, condition about the same. At Dr. Simpson's request, Dr. Keen saw her in consultation with a view to aspiration. In view of the pain before experienced, it was not thought best to use an aspirator needle, but a hypodermic point was attached to the aspirator, and plunged into the tumour; ℥x of dark fluid was drawn off, when no more could be obtained. Morph. gr. ¼, hypodermically. No palpation of the gall-bladder was made for two days, lest a little fluid should be pressed out of the tumour and cause peritonitis.

27th. Very sharp pain in the tumour, and some tenderness on pressure; moderate tympanites is now present. Bowels not opened. Temp. 102°.

28th. A careful examination was made for stone in the gall-bladder, but none could be found. Suffered much pain afterwards. Tongue dry. Temp. 101°. Stool clay coloured.

29th. Pain and tenderness almost entirely disappeared. Feels much better.

Nov. 3. Transferred to the Surgical Ward. Has been feeling much better for the last two days; less vomiting; no pain; sleeps fairly well; tympanites persists; temp. 98.4°. The tumour has enlarged since the 26th; measures 5½ inches in diameter each way, and extends now from the median line to the right flank, and from the liver border to the groin, filling the entire right half of the belly. It can be readily grasped by one or two hands on depressing the belly wall; is globular, fluctuating, moderately tense, and moderately tender.

Operation.—After consultation, an exploratory operation was decided on, and was done at 1 P. M., November 4th, with the usual antiseptic precautions. Present, Drs. Grove, Mears, Koerper, Roberts, Ewing, and

Bonifil.   An incision was made, about three inches long, parallel with and two and a half inches to the right of the linea alba, beginning three-quarters of an inch above the level of the umbilicus, and over the most prominent part of the tumour.   Before incising the peritoneum, all bleeding was stopped, two ligatures and four artery forceps being used.   The peritoneum being opened, the lower border of the liver was seen projecting for nearly an inch.   It was pulled up by a retractor, and the tumour was then seen as a spherical mass.   No one was allowed to pass a finger into the abdominal cavity but myself, as I wished to add no possible risk.   I passed a finger in and traced the tumor readily up to the under surface of the liver, the large globular mass becoming somewhat sausage-shaped.   The choledoch duct was not felt.   Two points of adhesion to the omentum were found at the lower part of the tumour, both slight, both recent, and neither was disturbed.   At no time was the omentum or the bowel even seen in the wound, except once, when vomiting threatened to cause the intestine to protrude.   Pressure readily prevented this, and the bowel receded into the abdominal cavity.   Several ounces of bloody serum escaped from the peritoneal cavity.   It was of a slightly greenish colour.   The liver, gall-bladder, intestine, and belly wall in the incision were all of a dirty-yellowish or brownish-green.   A large aspirator needle was introduced into the gall-bladder, and ℥viij of a dark brown fluid were removed.   No more would flow, yet the gall-bladder was evidently nearly as tense as ever.   It was seized by a double-hooked forceps, and an incision of one and a half inches made into it ; a scoop or half-funnel used to carry off the water in syringing the ear being held under the opening, in order to carry off all the contents of the tumour without any escaping into the belly.   I had punched a series of small smooth holes in its base, intending to pass a thread through the wall of the tumour, and tie it fast to the scoop before opening it ; but the thread broke on tying, and I abandoned any further attempt at fastening it, as I did not wish to lose any more time, nor to pass another thread, as I found that the wall of the cyst was very vascular, the slightest puncture bleeding considerably.   The threads already there were used later as sutures.   The scoop was simply held in place, its flange being pushed into the abdominal opening, and the opening in the gall-bladder was held in place over it by the forceps.   The walls of the tumour could not be drawn out of the abdominal cavity, the fluids which had been already aspirated not having relieved the tension sufficiently.   The scoop, therefore, answered admirably, for otherwise a large amount of the contents must unavoidably have passed into the belly.

The wall of the gall-bladder was moderately thickened.   As soon as the gall-bladder was opened it was plugged from within by an apparent clot, which was of a deep black colour.   I inserted my finger, and found the bladder filled with a mass resembling in its feel a recent soft clot in the uterus.   By the finger it was broken up, and in larger and smaller masses was scooped out through the opening, amounting in all to ℥xij, making ℥xx of contents obtained from the tumour.   No gall-stone was found.   The lower wall of the tumour had now contracted, and was seen through the opening.   A bullet probe was passed upwards for a distance of six or seven inches, and the interior thoroughly but cautiously explored. Nothing was learned except that the wall was smooth, and no stone was to be felt.   It was uncertain whether the cystic duct was closed or open, as I could not be sure that the probe had entered it.   Nor did the finger reveal more.   The opening in the gall-bladder was therefore secured to

that in the belly wall by eight sutures of carbolized silk, and at the upper angle one hare-lip pin, all passing through the entire abdominal wall, including the peritoneum. Before this was done, careful search was made for bleeding vessels, and a little blood was removed from the belly by carbolized sponges. The cut wall of the gall-bladder bled considerably, and also the outer wall of the incision—not from any vessels, but by continuous and troublesome oozing. One small vessel spirted also from the inner wall of the bladder close to the cut. A long acupressure needle was therefore passed, including the outer wall of the incisions in both the belly wall and the gall-bladder, and a loop of wire was tightened over it. This stopped all bleeding. The fistula in the gall-bladder was left open, two carbolized sponges being placed below it to absorb any discharge of biliary matter (none of which had so far appeared), and the whole was then dressed in the usual antiseptic method. The operation lasted one hour and ten minutes.

After the operation she suffered a good deal from shock, became cold, and almost pulseless. Whiskey was given, and hot bottles applied to the legs and body. In about an hour she had revived, and was doing pretty well; suffered from pain in the wound; vomited frequently. Morph. gr. $\frac{1}{4}$ hypodermically.

7 P. M. Dr. Ewing found the dressing saturated with blood. It was removed, under the spray, and a half handful of clotted blood found under it. She had probably lost some eight or ten ounces. No one vessel could be found bleeding, but there seemed to be an oozing from the cut surface sufficient to make a little stream of blood flow from the wound. Ice was applied, which much diminished the flow, and stopped it entirely in about an hour. He passed his finger into the opening made in the gall-bladder, which was closed by a clot of blood, and there followed a stream of blackish fluid tinged with blood, about four ounces in all.

8.30 P. M. Her condition was only tolerable; pulse weak: does not seem much weakened, however, by the loss of blood; suffers no pain: temp. 98.4°. She has had whiskey f℥ij; milk f℥ss; lime water f℥ss; every half hour since the operation. This is now given in smaller quantities and at more frequent intervals. Vomiting about every half hour.

11 P. M. No bleeding; still vomiting.

2 A. M. Morph. sulph. gr. $\frac{1}{4}$, hypodermically, as she was restless and suffered considerable pain; temp. $98\frac{1}{5}$°; pulse 100.

Nov. 5. 8.30 A. M. Very weak, almost pulseless, but surface warmer, and tongue moist. Vomited about every half hour all night. Remained in the same condition all the morning.

2 P. M. Whiskey f℥j; milk f℥ij; given by enema every hour.

She gradually became weaker, vomiting almost constantly until 1 A.M. Nov. 6th, when she died, 36 hours after the operation. *Post-mortem* by Dr. Ewing 15 hours after death. Rigor mortis marked; much emaciated; not so deeply jaundiced as when admitted to the hospital. An incision was made from the ensiform cartilage to the pubes, and a second across the hypochondriac region. There was no peritonitis. The entire contents of the belly without an exception were of a dirty but deep greenish colour. A recent clot was found that would represent about ℥iv of blood. The liver, gall-bladder, and as Dr. Ewing supposed, the duodenum and common choledoch duct were removed with the part of the abdominal wall, including the incision. The liver was moderately enlarged, and very soft, and its capsule tore with abnormal ease. Its colour on section was a dirty

ochrish-green, and its disintegration such that no positive conclusion could be reached as to whether the bile ducts were dilated. The two hepatic ducts were dilated, so as to admit the forefinger. The gall-bladder was slighly adherent to the abdominal wall at the seat of the operation. It had shrunk greatly after the evacuation of its contents, was pear-shaped, and now measured six inches long from its duct to the base, and three and a half inches across the widest part just above the base. The cystic duct proper was not dilated. Most unfortunately the common choledoch duct just beyond the junction of the hepatic and cystic ducts was cut off. The inner surfaces of both the gall-bladder and the hepatic ducts were of the same general dirty greenish-ochre colour. A few points of slight ecchymosis were seen.

The two bottles, one containing the unmixed liquid obtained by aspiration of the gall-bladder, the other, seeming clots from the gall-bladder after opening it (this last unavoidably mixed with some recent blood from the operation) were referred for microscopical examination to Prof. J. G. Richardson, and for chemical examination to Dr. Henry Leffman.

Microscopical Examination.—Dr. Richardson reports as follows :—

" The aspirated fluid contains a few plates of cholesterine and numerous altered (swollen and decolorized) red blood-corpuscles.

" The denser liquid is loaded with blood-corpuscles, plates of cholesterine, and brownish granular material, no doubt the débris of altered blood. Both fluids show the two bands in the green of oxidized hæmatin when examined under the micro-spectroscope.

" Experiments made to determine the destructive power of bile upon blood resulted as follows :—

" In a mixture of equal parts of fresh blood from my finger, and of bile removed at an autopsy eight hours previously, the red corpuscles were invisible after twenty minutes.

" Four drops of the same bile, added to a mixture of four drops of fresh blood in 60 ⋙ of .75 per cent. salt solution, caused the disappearance of the red corpuscles in less than twelve hours. One drop of the same bile in a similar mixture produced no obvious effect after twelve hours' contact.

" Hence, if we discover well-defined red blood-corpuscles in a fluid supposed to contain bile twelve hours after it is drawn from the body (or twelve hours after blood has been mixed with it), we may conclude that the amount of hepatic secretion in the liquid does not exceed seven per cent. (6.66)."

Chemical Examination.—Dr. Leffman reports as follows :—

" The samples consisted of a dark brownish-black liquid in quantity about six fluidounces, and a reddish-brown liquid in quantity about twelve ounces, and containing numerous clots, some of them fresh blood clots, others very dark in colour. The first mentioned liquid was tested for the bile acids and bile pigment directly, but gave no results. Even upon evaporating a portion to dryness no satisfactory reaction could be obtained, and the absence of the characteristic substances of bile seemed probable. However, a more thorough examination was made, adding to the remainder of the liquid some alcohol, filtering and evaporating to dryness, treating with ether, and then exhausting the residue with absolute alcohol. This alcoholic extract on being carefully evaporated to dryness gave, with the usual test, a splendid colour, indicative of the presence of the bile acids, though in very small amounts. The liquid was clearly not normal bile. Of the second liquid a portion of the darker coloured clots was taken, and treated so as to extract the cholesterin. The quantity taken was about four

grammes, and the bulk of the mass about two cubic centimetres. The experiment indicated that the quantity of cholesterin was very small. I did not obtain from the above quantity an amount sufficient to determine the weight. The dark clots were, therefore, chiefly old blood clots and not partly inspissated bile. As a confirmation of this I also observed that the dark clots when exposed to the air reddened perceptibly as blood does from oxygenation on a similar exposure."

Remarks.—Originally proposed by Petit and later by Maunder and Hughlings Jackson, so far as I know this is only the second case in which cholecystotomy has been done. The first will be found in the *British Medical Journal* for June 8, 1878, p. 811. (See this Journal for October 1878, p. 565.)

In that case the patient, also a woman, æt. 45, suffered with persistent jaundice, clay-coloured stools, nausea and vomiting, and the most intense itching. This wore out the patient, and was not relieved by any medication external or internal, but disappeared after aspiration, when ℥xxxij of a dark brown fluid were removed from the gall-bladder. One month later cholecystotomy was performed by Dr. J. Marion Sims. He removed ℥xxiv more of a similar fluid, and 60 gall stones, and established a biliary fistula. The patient did well for a week, when general hemorrhages came on and she died 30 hours later with black vomit. Eighteen more sacculated gall-stones were found. The bile ducts in the liver were dilated. There was no impacted gall-stone in the common choledoch duct. No mention is made of the exact condition of the hepatic or cystic ducts, but after the gall-stones were removed from the gall-bladder a probe could be passed from the gall-bladder into the intestine.

The first question that presents itself in the present case is that of diagnosis. Was there obstruction, and if so what was the cause of it? There is no reason to doubt that there was a mechanical obstruction in the common choledoch duct. The deep and long-continued jaundice for over four months, the clay-coloured stools, the nausea and vomiting, the very persistent and annoying itching, and the distended gall-bladder, all observed during life, clearly pointed to this; while the distension of the gall-bladder and of the hepatic ducts positively determined at the post-mortem point to the common choledoch duct as the seat of the obstruction. The unfortunate accident which precluded any examination of the common choledoch duct leaves us in doubt as to its cause, whether an impacted gall-stone, or inflammatory thickening, or occlusion. From the absence of any history of biliary colic, and the gradual onset of the disease, it was most likely not a gall-stone. No tumour was found that could have occluded it by pressure.

The second point for discussion is the symptoms. Dr. Sims correctly quotes Murchison as asserting that itching is uncommon except in jaundice from mechanical obstruction. Frerichs says it is present in one-fifth of the cases, but makes no mention of its relation to mechanical obstruction. Watson mentions it as present at the beginning of an attack of jaundice, but is also silent as to any special significance to be attached to it. I have examined several other authors, and find usually no mention made of it. It is a point of great importance if it be true that it is in any sense

pathognomonic of obstruction. In the present case it was observed, but though severe did not assume the intense form that was seen by Dr. Sims.

The increase in size of the gall-bladder is of moment. The enlargement was gradual and continuous, but no special increase I am told took place after the first tapping, when a few drops only were withdrawn by the hypodermic syringe for diagnostic purposes. It is to be noted that precisely the same needle was used the second time, for I was unwilling to risk the use of even the smallest aspirator tube in view of the pain, local inflammation, and fever which followed the first puncture. That this was no needless precaution was shown by the similar but more marked symptoms that followed the second puncture. At the operation a large quantity of old clotted blood was removed from the gall-bladder. Did this come from hemorrhage following the puncture? I am inclined to believe that some of it did but not all. The gall-bladder perceptibly increased in size after this puncture (from nearly 5 to $5\frac{1}{2}$ inches in diameter), but it did not double its size, yet the amount of clot found was ℥xij, out of ℥xx. Moreover it will be observed that at the second puncture when ℥x of fluid were removed no more could be obtained, which would seem to show that the clots were then present. These facts, taken in conjunction with the hemorrhagic tendency in these cases generally, and with the oozing which occurred at the time of the operation and later, and with the fact that no symptoms were observed after the second puncture indicative of serious bleeding, all incline me to the belief that much of the blood found was due to hemorrhage preceding both of the tappings.

As to the character of the fluid contained in the gall-bladder, in Dr. Sims's case it is stated that the fluid was not bile, as was proved both microscopically and clinically. In the present case there seems to have been a small percentage of bile present, but certainly less than $\frac{1}{15}$th (6.66 per cent.) or the blood corpuscles would not have been altered but destroyed, as Dr. Richardson's careful experiments show—a view confirmed also by Dr. Leffmann's chemical examination.

In future cases this may be of value from a diagnostic point of view. Some of the fluid can always be obtained either by the aspirator, or hypodermic needle, and can be examined both microscopically and chemically, and tested by its effect on normal blood. These combined tests will prove its character beyond a doubt, and show the stage the disease has reached. In such a new operation all the light that may aid us in reaching a correct conclusion is to be eagerly sought.

But, after all, the great question is, was the operation justifiable? It is plain that I would answer in the affirmative, or I should not have done it. And after careful consideration I am still of the same opinion. True, the patient died, but the ante-mortem symptoms no less than the post-mortem facts indicate that if nothing had been done death was very near, either from exhaustion, hemorrhage, or even rupture. That patients can live

readily with biliary fistulæ is well known, and it is but following the indi-
cation of nature in such cases to make a fistula by operative means ; and
with the comparative safety of the antiseptic method I believe it to be
justifiable to proceed as has been done in these two cases.

"Given," says Marion Sims, "a case of persistent jaundice with clay-coloured
stools, nausea and itching [and I would add perceptible enlargement of the gall-
bladder], we may almost certainly infer that there is mechanical obstruction of
the ducts of the gall-bladder. Why then should we wait for months for the gall-
bladder to become dropsical and to swell up into an enormous tumour, filling the
right hypochondrium and extending even to the iliac region [and causing hepatic
degeneration incompatible with life] ? Why not open the abdomen, explore the
condition of the liver, and if we find gall-stones, why not open the gall-bladder,
remove the gall-stones, and sew up the incision in the gall-bladder with the same
security, the same confidence that we would stitch up a wound of the intestine ?
There is no reason why it should not be done, and it will be done ; so it will
eventually be seen that the operation of cholecystotomy, joined with Dr. Hand-
field Jones's proposition, will open up a new field in the great domain of abdo-
minal surgery."

Dr. Handfield Jones's proposition (*Med. Times and Gaz.*, March 9,
1878, p. 247) was to open the abdomen in a case of obstruction believed
to be due to gall-stone, and push the gall-stone into the intestine by ma-
nipulation without opening the gall-bladder. When in the present case
my finger was introduced into the belly, I could detect nothing more than
the diminishing pyriform tumour of the gall-bladder. When I had opened
the gall-bladder, had I found a gall-stone and been able to convince my-
self that the duct was open after the removal of the stone, I was prepared
to sew up the incision in the gall-bladder by Gély's intestinal suture, and
return it bodily into the belly ; but not being able to convince myself of
the removal of the obstruction I deemed it best to make the fistula, and in
case of recovery to treat it as circumstances indicated.

As to the operative procedure I have little to add. The danger of the
escape of the fluid into the abdominal cavity was admirably met by the ear-
scoop. A larger one provided with a clamp or hook at each corner might
be used with great advantage I think in ovariotomy. The hemorrhage in
any advanced case will always be a serious question, for the general oozing
is difficult to arrest. Even had Dr. Sims's case not warned me, I would
not have removed any of the gall-bladder, and yet as it was, I had trouble
with the hemorrhage. One or two slight inadvertent pricks caused con-
siderable oozing.

The cause of death was threefold ; 1st, shock ; 2d, secondary hemor-
rhage ; and, 3d, her generally deteriorated condition, due to persistent
vomiting and the far advanced disintegration of the liver. Her age, too,
was much against her. Had she come into the hospital at a much earlier
period, when the obstruction was recent and the cystic tumour just begin-
ning, before her liver had undergone such profound changes and her
health been so deeply undermined, then I believe the operation might
very possibly have saved her life ; this, too, independently of the cause of

the obstruction, whether it be inflammation or a gall-stone. For if a gall-stone it might possibly have been removed, or if inflammation, the relief of the tension might have allowed it to subside, and the duct to become pervious; and even if these results had not been obtained, the dangers of an operation and a permanent biliary fistula are at least not greater than those of continued obstruction.

Article XVIII.

Double Ligation of the Internal Carotid Artery in 1869, by Dr. A. T. Lee, deceased, formerly of Kingston, Tennessee. Reported by Meriwether Lewis, A.M., M.D., President of the Loudon County Medical Society, Lenoir, Tenn.

As Louisiana was the pioneer State of the Union in the performance of Cæsarean section, and Kentucky of Ovariotomy, so to Tennessee is already accorded the honour of the first successful performance of the operation mentioned in the above caption—the internal carotid having been ligated by Prof. W. T. Briggs, of Nashville, in February, 1871.

An interesting little *brochure*, by Prof. W. K. Bowling, published in 1874, will be remembered, in which the priority of Prof. Briggs was definitely established; Dr. Sands, of New York, having ligated the artery in October, 1872, eighteen months subsequent to Briggs's operation.

From the new case related below, it will be seen that the internal carotid was ligated by Dr. Lee, of Kingston, Tenn., on the 31st of July, 1869, one year and nine months before Dr. Briggs's case.

On that day, David C. White, a miller, was wounded in the neck, at the angle of the lower jaw, by the large blade of a pocket knife, which penetrated to the depth of three or four inches, and injured the internal carotid. The integumentary wound was somewhat in the shape of the letter **S**. Alarmed by the tremendous jets of arterial blood, Dr. J. M. Denning, in whose drug store the stabbing occurred, immediately seized the man's neck and compressed the carotids. Happening to be close at hand, Dr. Lee promptly cut down upon the artery by the usual incision, exposed it by careful dissection, found the bleeding point, and applied a ligature on the proximal end of the artery.

The patient, who had fainted, now rallied, and severe arterial hemorrhage occurred, coming, of course, through the vertebrals, the opposite internal carotid, and the circle of Willis. A ligature was, therefore, immediately thrown around the distal portion of the injured vessel and arterial bleeding at once stopped. The patient was now pulseless, and death was considered imminent; but under prompt and energetic stimulation with whiskey and ammonia the circulation soon became good; respiration grew full and regular; and, at the expiration of fifteen minutes from the close of the operation, the patient spoke. He was confined to bed for five weeks.

In January, 1874, while temporarily acting as resident physician at the Oakdale Iron Works, Roane Co., Tenn., I frequently saw and conversed with Mr. White. At that time, however, no information in regard to the nature of the wound or of the subsequent operation had been obtained from professional sources; hence, but little interest was taken in the case. To-day, Oct. 5, 1878, I am informed by Mr. R. B. B. Williams, of this county (Loudon), that White is still alive, and engaged in running a saw-mill near Wartburg, in Morgan Co., Tenn. Mr. White has suffered and is still suffering from partial paralysis of the muscles of the neck—habitually carrying his head a little to one side.

Dr. Lee was a young man, an ex-surgeon, I have been informed, in the United States Army. He died not very long after the performance of this rare and formidable operation, which fact, together with his unassuming modesty, has thus left to a stranger's pen the not ungrateful task of putting on record his operation. The facts, as stated above, were fully corroborated by all the physicians of Kingston.

The only artery that could have been mistaken for the internal carotid was the external, but the numerous branches of the latter, its relations with the hypoglossal nerve, its great depth, and the relative position of the two vessels, preclude such an idea.

The operation was bold, brilliant, and at that time unperformed by any other surgeon. The late war did not furnish a single instance, although the common carotid was tied once for wound of the internal, but, of course, without success. ("Medical and Surgical History of the Rebellion," Part I, vol. II. p. 419.) Keith, of Aberdeen, Scotland, ligated the internal carotid by the Hunterian method, with a single ligature (*vide* "*Monthly Journal of Medical Science*," Edinburgh, May, 1851, p. 435), but Dr. Lee was the first surgeon on record to apply the double ligature —the method of Guthrie—to a wounded internal carotid.

For the above-mentioned facts I am indebted to my friends, Dr. W. T. Hope, of Chattanooga, Dr. J. M. Denning, of the same city, and to Mr. Lewis W. Lenoir, now a medical student at Washington City.

Article XIX.

LITHOTRESIS AND VAGINAL LITHOTOMY. By ANNA E. BROOMALL, M.D., Resident Physician of the Woman's Hospital of Philadelphia.

THE following case is of interest, not only from the rare occurrence of stone in women, but more especially from the manner of perforating the calculus :—

Susan C., aged 57, English by birth, and residing in central New York, entered the Woman's Hospital of Philadelphia, October 10, 1878. The only item of special interest in her family history was that a brother had suffered from attacks of gravel.

The patient stated that her general health had been good, but that she had suffered from dysuria during the greater part of her life. Menstruation began at the age of sixteen and ceased at the age of fifty-one. She married at eighteen and had given birth to seven children. Between the birth of the first and the second child she suffered from prolapsus of the uterus. She emigrated in her early married life, and since then had been residing in central New York, in a region where the water was hard, living for six years on a farm where the well-water was very strongly impregnated with salts. Eight years ago she had a sensation as of " something dropping," after which she had great difficulty in urination, but, under medical treatment, she was relieved. In the following year she had a severe attack of pain while riding, and afterwards the urine was bloody. Five years since she was examined by a physician, who told her that she had inflammation of the womb and neck of the bladder. At the menopause she suffered from severe pain in the abdomen. One year ago the vesical and rectal tenesmus was extreme, and she complained of a feeling of fulness and plugging of the urethra. She again sought medical aid, and was told that the symptoms came from retroversion of the uterus. Then, and for the first time, she noticed a sediment in the urine, and, fearing that she was suffering from stone, she submitted to another examination, and was assured that there was no calculus, but that the trouble came from the condition of the urethra. She obtained no relief, and last winter she consulted another physician, who told her that she had a tumour in the anterior part of the pelvis, but no opinion was given as to the nature of the growth.

Dr. Emeline H. Cleveland, who was visiting in the neighbourhood last September, saw the patient and recognized the presence of a large calculus which filled the entire bladder. The patient, notwithstanding her great exhaustion, was very desirous for an operation, and eagerly availed herself of the proposition to come to Philadelphia for treatment. Owing to Dr. Cleveland's ill health, the case was placed under my care.

Upon admission to the hospital the patient was very much emaciated; her countenance was haggard and complexion sallow; the tongue was thickly coated; the superficial veins over the entire body were distended; venous pulsation in the neck was marked, especially upon the right side.

Examination per vaginam revealed a hard and very firm body in the anterior part of the pelvis, extending further upon the left than upon the right side. The uterus was small, and was pushed above and behind the mass. The introduction of the sound three-quarters of an inch in the urethra revealed the presence of a stone, in fact the calculus could be seen through the dilated meatus. The sound could not be passed between the stone and the walls of the bladder, but the surface of the calculus which could be reached was rough and friable. The urethra was shortened, dilated, and directed forwards, so that it was necessary in order to introduce the sound to hold it at right angles to the patient's body. There was some incontinence of urine. The tenesmus was extreme. The patient was unable to void any urine except while standing, and even then with so much effort and with so much pain that her groans could be heard in distant parts of the hospital.

The specific gravity of the urine was 1015; it contained albumen, but, although repeatedly examined for pus, none was found.

During the nine days previous to the operation the pulse ranged from 100 to 120. The temperature varied from 100° to 105° Fahr. The

patient's appetite was poor and her general condition was miserable, so that little beyond temporary relief could be expected from an operation.

It was decided in consultation to make a vaginal incision, crush the stone, and remove the fragments through the wound; and it was suggested by Dr. Albert H. Smith to break the stone by means of a drill rotated by Bonwill's dental engine.

A diamond drill was prepared specially for the purpose, consisting of a black diamond about a half centimetre in length, set lengthwise across the end of a steel shaft about ten centimetres long, with a sharp tip exposed, so that the perforations would be made of a diameter corresponding to the whole length of the diamond. This shaft, when fixed in the mandril of Bonwill's engine, as used in the hospital with an attachment for multiplying speed, could be made to rotate easily 10,000 times per minute, and would perforate any hard calcareous mass with great rapidity and with very slight pressure.

To secure a firm grasp as well as for crushing the stone easily after perforation, strong lithotomy forceps, as shown in the cut below, were made with separable blades to be locked after introduction, as in the obstetric forceps, and provided with an adjustable screw for gradual compression, to avoid the possibility of injury to the walls of the bladder by the sudden yielding of the stone.
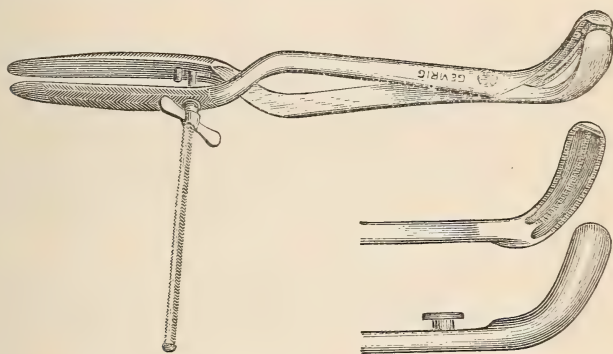
Operation.—On Oct. 19th the patient was etherized and placed upon her right side, with hips elevated and thighs strongly flexed. After the introduction of Sim's speculum, I exposed the stone by an incision in the median line of the anterior wall of the vagina. The opening was four centimetres in length and extended in front to the vesical extremity of the urethra. The vesico-vaginal septum was thickened and œdematous, but there was little bleeding. I attempted to grasp the stone with the forceps, but I was unsuccessful, owing to the contracted state of the bladder and the impossibility of passing the blades between its walls and the stone, on account of the embedding of the rough surface of the calculus in the folds of mucous membrane. Other forms of lithotomy forceps were tried with no better success, until finally all efforts at grasping the stone were abandoned and reliance placed alone upon the hold of the bladder, which promised sufficient firmness to resist the feeble pressure made by the rotating drill. The edges of the wound were separated by retractors, bringing the stone into view, the surface of which was of a dirty-brown color and very friable. The portion exposed was riddled by a close

succession of perforations by the diamond drill, worked with the assistance of Dr. Bonwill. When a section was sufficiently perforated, it was broken up by a pair of bone forceps, and thus portion after portion of the stone was reduced to fragments sufficiently small to allow of their extraction, the largest being not over two centimetres in diameter. After getting an opening of sufficient size, the corundum burr was tried for the purpose of enlarging it, but was not successful on account of the hardness of the stone, especially of its nucleus.

The perforation and extraction occupied forty-five minutes, a greater portion of the time being consumed in repeated examinations for fear of injuring the bladder, time which was unnecessarily spent, as the condition of the vesical walls at the close of the operation proved. Careful examination of the bladder failed to detect the least laceration. The mucous membrane was found hypertrophied and gritty from particles of stone held in its folds, but its condition was in striking contrast to that of the lacerated and contused bladder of a patient operated upon in the hospital in June, 1876, where, after dilatation of the urethra, an ordinary lithotrite had been used to crush a stone of about the same weight, although in that case the greatest care had been taken to avoid injury.

After the extraction of the fragments of stone, the bladder was carefully washed out. The edges of the wound were cleansed, brought together, and united by silver sutures held by shot. Goodman's self-retaining catheter was introduced, and the patient put to bed. She reacted promptly, and did well until five days after the operation, when she had a chill, which was followed by great exhaustion, and she died three days afterwards.

The fragments of stone weighed 1935 grains. According to the analysis made by Prof. Bodley, the nucleus of the calculus was composed of oxalate of calcium, and the surrounding laminæ of phosphate of calcium.

The urine for the first three hours after the operation was slightly bloody, it then became clear, and afterwards thick and ropy, which last condition continued until death.

The *autopsy* was made thirty hours after death. The left kidney weighed five ounces, and was found to communicate with the bladder by two distinct ureters. The supernumerary and smaller ureter had its origin at the lower extremity of the kidney. The two ureters opened in the bladder side by side. The inner surface of the larger ureter was studded with small cysts filled with a gelatinous substance, a condition which was found to be due to distension of the follicles. The pelvis of the kidney was distended with pus. The cortex was reduced, and the capsule was firmly adherent. The right kidney weighed four ounces, the capsule was peeled off with difficulty, and left a granular surface. The cortex was reduced. Several small calculi were found in the pelvis. The ureter was dilated at its lower extremity, and constricted at its middle portion.

The vaginal wound had united only half its length. The ununited edges were sloughing; one stitch had become detached. The entire mucous lining of the bladder was swollen and reddened. There were no fragments of stone in the bladder, and no evidences of laceration or contusion.

There is every reason to believe that the patient would have recovered had she not been suffering from chronic disease of the kidneys, for, notwithstanding the extreme exhaustion which necessitated a postponement of the operation from day to day until it was feared she would die before relief could be obtained, she recovered entirely from the effects of the operation, and died of chronic nephritis.

For the following references in regard to perforation of the stone after incision in the bladder, I am indebted to the kindness of Dr. John Ashhurst, Jr.:—

Mr. W. B. Dickinson, in the "History of a Case of Lithotomy,"[1] finding it impossible after an incision to grasp a very large stone, estimated to be the size of the globe of a large goblet, by means of the stone breaker, resorted to perforation on the recommendation of Sir Astley Cooper. The stone was held by a blunt midwifery hook, and a common small chisel was used to break the calculus, after which the fragments were extracted. The bladder was washed out. The pieces of stone weighed eight and a half ounces, and two ounces and a half of fragments were supposed to have been lost in the injections. The composition of the stone was mainly phosphate of calcium. The patient recovered with fistulous openings of the perineum. He had suffered for thirty years from symptoms of stone. The only point of interest in the convalescence was the sloughing of the recto-vesical septum sufficient to allow the escape of feces through the wound.

Mr. H. Earle, in "Remarks on the Danger of Extracting Large Calculi,"[2] reports a case occurring in Sir Astley Cooper's practice. The patient was forty-three years of age, and he had suffered from symptoms of stone for many years. An incision was made, but the forceps could not grasp the stone on account of its size. An unsuccessful attempt was then made to break it with a pair of strong forceps. It was then attempted to penetrate the stone with a gimlet, but with no better result. The wound was then enlarged, after which the calculus was extracted by the forceps. It weighed sixteen ounces.

Mr. Earle, after citing numerous instances of the extraction of large calculi, and considering the great mortality attendant upon such operations, concluded that it is much better to crush large calculi by some other mechanical contrivance than the forceps. He referred to instruments of various forms, all, however, with the object of crushing the stone by means of closure of the instrument, with the exception of the invention of Le Cat, which consisted in a perforator surrounded by a canula for protection of the bladder. Instruments of various sizes were to be used until the hole was sufficiently large to admit one which should break the stone by the forcible separation of its parts.

Civiale[3] recommends for the perforation of the stone the use of the *casse-pierre*, somewhat modified, consisting of lithotomy forceps furnished with a drill, the action of which will produce sufficient perforation of the stone to allow free crushing. He reported twenty-four cases in which the instrument was used with the result of five deaths and nineteen recoveries.

Thompson[4] refers to the custom in both London and Paris of employing

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[1] Medico-chirurgical Transactions, vol. xi.

[2] Ibid.

[3] La Lithotritie et la Taille.

[4] Practical Lithotomy and Lithotrity.

in lithotomy some method of reducing the size of the stone when it exceeds four ounces, and he speaks of the instrument of Civiale as being the best for the purpose. He urges a careful consideration of the following difficulties which may be anticipated in crushing a large stone in lithotomy: 1st. The injury to the bladder from the manipulations necessary to fix the stone. 2d. The laceration and contusion of the mucous membrane of the bladder during the removal of rough fragments of stone. 3d. The manipulation and frequent washing out necessary to remove all particles of stone from the bladder. In lithotomy in women, however, the last objection is not of so serious consideration, as the bladder is more accessible and can be more readily washed out.

As a lithotrite a diamond drill has superior advantages from its small size, its rapidity of action when rotated by the dental engine, and avoidance of risk to the integrity of the bladder—advantages which strongly recommend its use upon stones too large to be safely removed through natural or artificial openings.

Article XX.
The Medicinal Qualities of Capon Springs, West Virginia.
By J. L. Le Conte, M.D., of Philadelphia.

Capon Springs are situated in Hampshire County, West Virginia, on the western slope of the ridge of the Alleghanies, known as the North Mountain, along the crest of which runs the boundary between Virginia and West Virginia. The elevation is stated, in the published pamphlet recommending the medicinal qualities of the water, to be about 2000 feet above tide level; but I feel certain, from the vegetation of the surrounding hills, as well as from the general topography of the country, that this estimate is above the true position, and refers probably to the crests of the neighbouring hills. In the absence of barometrical observations, however, this must be considered merely as my individual opinion, unsupported by accurate knowledge.

The climate during the exceptionally hot summer of 1878 was moist, but not rainy. The showers were not frequent, and the clouds seemed to be attracted by the higher ridges to the south, east, and north. The days were warm, and though the thermometer in a well-shaded station, protected from reflection, rarely rose above 86° Fahr. at midday, yet the difference between the wet and dry bulb was usually not more than 3° to 5°. Exertion during the middle of the day was, therefore, oppressive, and the best time for exercise was early in the morning, before breakfast. The nights were generally cool, only three during the season having been exceptionally warm and unpleasant for sleeping.

The sources of mineral water are three, close together; two of them on the banks, and the third in the bed of a small stream which flows

through a narrow ravine in which the hotel is situated. This last-mentioned one is not now utilized, but can be used in future if a larger supply of water for the baths is needed.

The bathing-houses are large, and well supplied with hot and cold water from the main source. The second source, called Beauty Spring, is only a few feet from the main spring, and, as is shown by the analyses given below,[1] is not essentially different in its composition. The temperature of the springs is 65.5°, and the free gases are seen continually ascending in large bubbles.

It has been supposed by some persons, even of professional education, that the medicinal effects of the hot baths would be somewhat weakened by heating the water in the boiler. But I found on investigation that this view is illusive; for not only does a very trifling incrustation occur in

[1] These analyses were made, as I was informed, by Prof. J. W. Mallett, of the University of Virginia. "The following result was obtained on complete analysis, making the usual assumptions as to the distribution of acid and basic constituents. In all probability, the silicate really exists as soluble silicic acid, or a silicate:—

GRAINS PER IMPERIAL GALLON.

	No. 1. Main Spring.	No. 2. Beauty Spring.
Sodium carbonate	.591	.631
Lithium carbonate	distinct trace.	faint trace.
Calcium carbonate	8.325	8.355
Magnesium carbonate	1.441	1.269
Ferrous carbonate	.041	.052
Manganous carbonate	trace.	trace.
Cupric carbonate	——	trace.
Sodium chloride	.056	.054
Potassium sulphate	.170	.163
Strontium sulphate	trace.	trace.
Calcium sulphate	.593	.408
Calcium phosphate	.002	.002
Calcium fluoride	trace.	trace.
Alumina	.018	.015
Silica	.707	.672
Nitrates	trace.	trace.
Organic matter	.204	.189
	12.148	11.810

DISSOLVED GASES.

CUBIC INCHES PER IMPERIAL GALLON.
(60° F. and 30 inches press.)

	No. 1.	No. 2.
Carbon dioxide	8.57	7.81
Oxygen	1.76	1.69
Nitrogen	3.68	3.71
	14.01	13.21

FREE GASES.

From No. 1, gas escapes in bubbles at frequent intervals, to the extent of about 300 or 350 cubic inches per hour. This consists of—

Nitrogen	78.74
Oxygen	9.02
Carbon dioxide	4.38
Marsh gas	7.87
	100.00

The specific gravity of the water was found to be—

No. 1	1.000.091 } at 15.5° C.
No. 2	1.000.088 }

The temperature of the water is 65.5° F., showing the springs to be distinctly thermal.

The water from the two springs may be considered as essentially the same. It resembles in composition that of the Bethesda Springs, at Waukesha, Wisconsin."

the boiler, but the hot water is delivered at such a high temperature, that a comparatively small quantity is required to bring the cold water to any temperature capable of being endured.

It will be readily seen from the small quantity of alkaline carbonates in these waters, that in order to produce specific remedial effects, the waters must be taken in large quantities; this can be done without inconvenience, as the temperature is above that of ordinary spring water, and it is thus very rapidly absorbed from the stomach, and eliminated by the skin and kidneys.

The diuretic effect of the water varies greatly with different persons. Some were affected by four or five glasses a day, say a pint and a half, while in others no result was produced by less than eleven or twelve. I experimented carefully in my own person, and found the best results obtained by from eleven to sixteen, depending on the temperature of the day and the amount of perspiration. With these quantities, the urine became very copious and pale in colour; but I observed no special purgative effect on the intestines. I am the more confirmed in the correctness of this view, because of those patients who thought that they observed intestinal derangements proceeding from the use of the water, an equal number attributed to it laxative or constipating effects.

As to the proper time for taking the water, it should be drunk not less than half an hour before, nor one and a half hours after the meals. From three to four glasses can thus be taken before breakfast, and in the intervals between meals, or during the evening, without any inconvenience. The restrictions in diet will of course depend on the particular disease to be treated, and the individual peculiarities of the patient; minute directions, as well as the adjuvant medicines to be employed, must be properly left to the judgment of the medical adviser.

Now, as to the groups of disease in which the water has been found beneficial, they may be classed as (1) those affecting the urinary organs; (2) those of the digestive apparatus; (3) those of the reproductive organs of females.

In the first class may be mentioned: (*a*) renal calculi composed wholly or in part of uric acid, and cystic deposits of the same substance. Upon these the water has a wonderful solvent power, rounding the rough portions of the calculi, so that their passage along the ureters is attended with less pain. The action of the alkalies upon the agglutinating material also tends to disintegrate the larger masses. Upon calculi of oxalate of lime, ammonio-magnesian phosphate, and other abnormal deposits, the water will of course have no effect.

(*b*) Certain cases of cystic catarrh are greatly benefited by the irritating qualities of the urine being lessened; but in general these cases are obstinate and require the assistance of other remedies, both local and general.

In the second class, it is found that many cases of dyspepsia depending on too free secretion of acid in the stomach, or on a gouty diathesis, are relieved after a few weeks' use of the water.

Congestion and enlargement of the liver, especially if caused by long-continued derangement of the portal circulation, produced by miasmatic influence, are also relieved by free use of the water in conjunction with podophyllin, or other medicines which increase the secretion of bile.   But it must be here remarked, that the quantity of alkalies in the water is so small, that by itself it will have scarcely perceptible effects in this form of disease.   Nevertheless, being the most accessible alkaline water to the inhabitants of this part of the continent, I consider it, when conjoined with the medicines above indicated, and properly restricted diet, as a most valuable agent.   The diet, especially if a tendency to fatty degeneration is suspected, should be modelled upon that used at Carlsbad, in Bohemia, and consists essentially in abstinence from fats, highly seasoned food, and stimulating or acid drinks.

In regard to the third class of diseases, those of the female reproductive organs, I can say nothing from personal observation, but by the kindness of professional friends am enabled to give briefly the results of their experience.

Cases of nervous derangement produced by uterine irritation have derived much benefit, and in one marked instance of epileptiform convulsions, the use of the water following upon a course of specific treatment has resulted in what is apparently a permanent cure.   In the imperfect menstruation of young girls, and in chlorosis, the menstrual function has been regularly established.   In these instances the effect has been probably due to the improvement of digestion, and the consequent assimilation of the normal amount of iron from the food.   Attention to this point is not sufficiently given in the treatment of chlorosis ; for it seems natural to suppose the absence of sufficient iron in the blood results primarily from a want of power to assimilate it from the food, and cannot be overcome by the internal administration of the compounds of that element.   The power of the blood to convey oxygen can, if this view be correct, be increased only by restoring the faculty of extracting iron from the food, not by increasing the quantity taken into the body, but by producing such change in digestion and innervation as will enable it to be absorbed and assimilated from ordinary nutriment.

Finally, a word of caution as to the beginning of a course of this water. If taken at first in large quantity it will disorder the stomach, and produce febrile excitement.   The proper way is, therefore, as in the use of other mineral waters, to begin with a few glasses, say two or three the first day, and gradually increase until free diuresis is produced.

By attention to the indications above given, and by a careful discrimi-

nation in the cases sent to this locality, I feel certain that few will leave the springs without being well satisfied with the results of their visit.

The rock through which the springs emerge is a light gray calcareous silurian sandstone of the Lower Helderberg group, containing rather poorly preserved specimens of *Productus galeatus;* about a quarter to a third of a mile northwest, and at a lower elevation is an iron spring breaking through slaty Devonian rocks of the Hamilton group. In a thin stratum at the side of the road are found excellent specimens of *Spirifer mucronatus,* and two other shells characteristic of that formation.

There is one important consideration which adds greatly to the value of Capon Springs as a sanitary station for invalids. As, however, it is of a moral and social nature, it could not properly find place in the brief account above given of the medicinal qualities of the water.

The hotel is the habitual summer resort of many families of cultivation and refinement, whose members outnumber the invalids to such an extent that the latter do not feel the depressing effects which result from the accumulation of patients in some sanitaria; and the beneficial effects of the water are not interfered with by too constant thought and conversation about disease.

The neighbourhood abounds in pleasant walks, rides, and drives, the roads are good, and the paths well kept. The hotel is excellently kept, and above all the drainage and cleanliness of the house and grounds are perfect. The offal and excreta are carried in underground pipes to the stream at a considerable distance from the house, so that no effluvia exist in the hotel. During the summer of 1878 but two cases of zymotic disease occurred, which even by any supposition could be attributed to local influence. These were both mild cases of diphtheria in children, the first was brought from a distant city, and developed immediately after arrival, the second was produced by personal contact with the first, whose condition was carefully concealed by the parents for several days after the first symptoms occurred. I am, therefore, strongly of the opinion that neither of them can be justly attributed to local poison. As soon as detected these cases were isolated in cottages, and recovered without any severe symptoms, or any after effects.

Article XXI.

A Report of an Operation for the Removal of a Subperitoneal Uterine Fibroid Tumour by Gastrotomy. Recovery. By J. B. Davison, M. D., of Moline, Illinois.

On the 17th day of February, 1878, I was called to see Miss S.; white; born in Ohio; aged 26; in stature below the average. She complained of pain in the bowels, of constipation and bloating. She presented the appearance of a woman at seven and a half months' pregnancy. She noticed

this tendency to bloating, as she termed it, eighteen months since; it increased gradually and slowly until within three months, since which time the growth has been rapid.

I soon became satisfied that a large tumour existed; supposed it ovarian, and told her and her friends that such was the case, and that, in my opinion, it was useless to pursue any course of treatment other than to remove it by an operation.

I communicated these facts to Dr. C. Truesdale, of Rock Island, and requested him to join me in the treatment of the case, should she determine to submit to the operation, which he kindly did.

Finally, she informed me that she had concluded to have the operation performed, and Tuesday, April 9, was set as the time. Accordingly, we met at her residence on that day, at 11.30 A. M., together with Dr. C. C. Carter, of Rock Island, and Drs. J. W. Morey and C. Piper, of Moline.

The patient was placed upon a table, and chloroform administered. We had a steam atomizer, by which the air of the room was charged with spray before commencing the operation, and the spray was kept up continuously until all the dressings were applied, and the patient in readiness for bed. The spray was from a solution of carbolic acid ℨij, in ℥xv of distilled water, and alcohol ℥j.

The patient being fully under the influence of chloroform, an incision of about five inches in length was made at the linea alba, between the umbilicus and pubes. On reaching the peritoneum it was found to be somewhat thickened, and between it and the tumour there was a net-like bundle of bloodvessels of considerable size. These pushed aside as best we could, the tumour was exposed. Believing that any adhesions which might be present would be easily broken up, the incision was extended up to near the umbilicus. A broad band was now discovered on the left side, high up on the tumour, which bound the tumour, though not closely, to the abdominal wall. In this band were many large bloodvessels, the whole of which were included in a ligature of silver wire, firmly applied. The ends of the wire were cut off close, and the band divided. A trocar was then plunged into the tumour; there was no discharge; the tumour was solid. Numerous points of adhesion were found and broken up; but it was impossible to remove the tumour through so small an opening. The incision was continued to the left of the umbilicus, and up two inches and a half above it, making, comparatively, an enormous incision; but even then it was with very great difficulty we succeeded in lifting the tumour out. The pedicle, which was two and a half to three inches in length, and three-quarters of an inch in diameter, was now secured by a strong silk ligature, and severed. It was found to be attached, or to have its origin, in the centre of the fundus uteri.

The surface of the tumour was smooth, and of a light-flesh colour; it was, internally, composed of a white fibrous substance, which was uniform throughout its diameter; its weight thirteen pounds.

We had a large-sized silver male catheter, cut off at the commencement of the curve, which we designed using as a drainage-tube. We had also a piece of rubber, one-third of an inch in thickness, one and a half in width, and two and a half in length, at about the centre of which the catheter was passed through. The tumour having been removed, this catheter was passed through the vagina, and thence into the cul-de-sac, which brought the rubber up to the vulva. All blood and serum possible having been removed by warm soft sponges, and oozing having ceased, the ends of the ligature applied to the pedicle were brought into the lower

angle of the incision, and the incision closed by interrupted silver wire sutures, so introduced as to include the peritoneum. Broad strips of adhesive plaster, reaching half round the body, were now applied; then a compress of fine white flannel, wrung out of hot water, was applied at each side of the incision; between these a few strips of patent lint, saturated in a mixture of ol. olivæ, glycerin, and salacylic acid (ℨxv oil, ℨj glycerin, ℨss acid). Over this was laid another compress of flannel, wrung out of hot water; over these a flannel binder; and over all a "London" abdominal supporter; the latter only to supply points of attachment for perineal bands, used to maintain a permanent position to the piece of rubber which held the drainage-tube in place, which purpose it served admirably.

The dressing completed, the patient was put to bed. She was somewhat pale, and expressed herself as sensible of a slight aching of the back, but highly gratified with the result. She now took gr. $\frac{1}{4}$ morph. sulph., and we left her in a very comfortable condition.

April 9, 8 P. M.—Pulse 96; temperature 99°. A few spoonfuls of nourishment taken, and rejected by the stomach. Morph. sulph. $\frac{1}{8}$ gr. every two or three hours.

10*th*, A. M.—Pulse 95; temp. 99$\frac{1}{2}$°. Rested well during the night; feels hopeful. Introduced catheter; drew off ℨv rather high-coloured urine. Continue morphia.

P. M.—Pulse 96; temp. 99$\frac{1}{2}$°. Patient has taken food, and is comfortable.

11*th*, P. M.—Pulse 104; temp. 100$\frac{1}{2}$°. No pain nor soreness; skin moist and warm; bloody serum discharging from drainage-tube freely.

14*th*, P. M.—Pulse 100; temp. 99$\frac{3}{4}$°. Patient comfortable; removed drainage-tube.

17*th*.—Dr. C. Truesdale visited the patient with me to-day. Dressings were removed for the first time since the operation. Adhesion has occurred throughout the whole extent of the incision. Sutures removed, except one at the lower angle; dressing applied as before, even the supporter, which the patient believed promoted her comfort.

20*th*.—Pulse 92; temp. 98$\frac{1}{2}$°. Patient feels tired, and a little tenderness in right iliac region. Changed the dressing, and removed the remaining suture.

25*th*.—Pulse 106; temp. 98$\frac{1}{2}$°. Patient complains of a sense of soreness near the umbilicus; at that point an abscess was forming. A small abscess has discharged. At this point the parts had not been intimately brought together, and hence the pus accumulated; but being freely discharged, cleansed, and dressed, it gave no further trouble.

May 3.—Pulse 88; temp. 98$\frac{1}{2}$°. Patient sitting up. Removed ligature from pedicle.

6*th*.—Patient passed through urethra a mass resembling fibrin, loaded with sand. Its passage caused agony for the time being, but, soon after, the patient was again comfortable. The sandy matter consisted of the triple phosphates, and the mass in which the sand was rolled up was probably a blood clot.

15*th*.—Patient has walked out a little to-day, and is in her usual health, except that the urine is alkaline, and crystals of the triple phosphates abound, keeping up irritation about the bladder and urethra.

She subsequently took nitric acid and phosphoric acid alternately, with quinia and iron, and at this writing her health is excellent, and her recovery perfect.

REVIEWS.

ART. XXII.—*Études Expérimentales et Cliniques sur les Traumatismes
    Cérébraux.*   Par le Dr. H. DURET.   Tome I., 8vo., pp. 327, XIX
    planches.   Paris: Le Progrès Médical and A. Delahaye, 1878.
Experimental and Clinical Studies upon Cerebral Traumatisms.   By Dr.
    H. DURET.

THE importance of the brain as an intellectual and vital centre, the ob-
scurity and complexity of its lesions, and the difficulties and uncertainties
of their treatment have made, and always will make, it an object of the
greatest (we had almost said melancholy) interest to both physicians and
surgeons, and this interest has been much quickened of late by the recent
advances made in our knowledge of the special functions pertaining to dif-
ferent portions of the cerebral hemispheres, and by the success obtained
by two French surgeons in cases of operative interference based upon this
knowledge.   The uncertainty concerning the exact seat of the lesion,
especially when the original traumatism had not caused a recognizable
fracture, and the symptoms had supervened tardily, made surgeons loath
to interfere lest they should needlessly compromise their art and themselves,
and the habit of hesitation thus induced led them, illogically, perhaps, but
not unnaturally, to extend expectant treatment to other cases also in which
more active measures were plainly called for, and even the point for the
application of the trephine clearly indicated.   When at last the urgency
of the symptoms became so great that the surgeon was in a measure forced
to operate, the condition of the patient had been rendered so grave by the
inflammatory and destructive processes that had been allowed to develop,
as to almost preclude recovery, and thus was established a vicious circle
—delay in interference leading to fatal results, and the sequence of fatal
results justifying or at least favouring delay—which has made trephining a
rare operation, and reduced the surgeon almost to the position of a simple
spectator in cases of injury to the skull.   In some hospitals it is considered
almost an axiom that the application of the trephine will be followed by
the death of the patient, and in the recent discussions in the Académie de
Médecine and the Société de Chirurgie upon the therapeutical uses to be
made of the newly-acquired knowledge of motor centres, the great danger
of this operation was the argument most strongly urged against interference
when the interior of the cranium was not already exposed to the air.

    It seems not unlikely that this fear of the trephine is a mischievous tra-
dition handed down from generation to generation and as ill-founded as
that of the intolerance of the urinary bladder so recently overthrown by
Prof. Bigelow.   Even if it is not so, antiseptic surgery has reduced, if it
has not entirely removed, the danger, and the only thing that is now re-
quired to justify the habitual substitution of active interference for the
present policy of expectation or resignation is greater certainty in the
means of diagnosis.

    For this reason we welcome any work that adds to our knowledge of the

nature and the means of diagnosis of cerebral lesions; and it is to this task that the author of the book now before us has addressed himself. The present volume deals only with the experimental study of cerebral traumatisms, the clinical aspects will be considered in the 2d part, which is yet to appear. In this volume we have an analytical study of the pathology and symptomatology of primary lesions, of cerebral commotion, compression, and contusion, and we are promised in the second the synthetical application of the results here acquired to the clinical aspects of these lesions as they are encountered by the surgeon. The scope of this part is indicated by some of the titles of its chapters: cerebro-spinal shock, the influence of an excess of pressure, the mechanism of compression, and the part taken by the dura mater, the meningeal vessels, and the different portions of the encephalon in cerebral traumatisms. The most original, and in some respects the most important, part is that relating to the subject first mentioned, and nearly half the volume is given to its consideration.

Cerebro-spinal shock (choc cephalo-rachidien) is the term employed by M. Duret to indicate the sudden arrest or suppression of the functional activity of the brain produced by a blow upon the skull or by an injection into its cavity, when the force is transmitted through and by the cerebro-spinal liquid to certain more or less distant regions of the encephalon, notably the 4th ventricle, and there exerts a vulnerant action. The nature of the shock, the mode in which the action is exerted, and the lesions which it produces were, he claims, discovered by him and first described in the book before us. To the exposition of its nature, cause, and effects, he brings an enthusiasm which is fully justified by the importance of the discovery, and if we feel some hesitation in accepting his analysis of mechanical problems whose very factors are often hypothetical and always complex, we must admit that the opinions of a conscientious worker thoroughly imbued with the scientific spirit, as M. Duret unquestionably is, and applying the test of experiment whenever possible, are not to be lightly questioned by the critic who can give perhaps only minutes or hours to the consideration of questions that have occupied the author for days or weeks. And yet when we remember that even simple problems in physics are beset with difficulties arising from failure to apprehend or rightly estimate the mutual relations of the parts, we may well doubt whether any one is qualified to deal with those presented by the infinite complexity of the skull and its contents. But while we cannot follow M. Duret through all his elaborate and painstaking explanations of the mechanism by which certain effects are produced, we can accept heartily his demonstration of those effects and of their relation to well-known clinical symptoms, and instead of losing by the elimination may even gain by increase of sharpness of outline and precision of conception. We can only gain by fixing our attention upon experimentally-ascertained facts to the exclusion of inferential explanations of them, and by declining to follow the author into hypothetical vacuums produced by questionable *cônes de soulèvement*.

Two facts, two lesions stand out prominently in the record of the experiments; with one of them we are all in a measure familiar, with the discovery of the other and of the agency of the cerebro-spinal liquid in producing both M. Duret is to be credited. But we cannot do better than follow the author's own dramatic method and begin with "*How I discovered the cerebro-spinal shock*."

He was seeking for the causes and the mode of production of concussion of the brain (*commotion cérébrale*), and had succeeded several times in producing its clinical symptoms by rapidly and forcibly injecting non-absorbable liquids into the anterior of the skull, but in these and even in other cases where the injection of from ten to twenty grammes of water had killed dogs instantaneously, he had found no lesion sufficient to account for the result. The tetanic contraction of all the muscles, the arrest of respiration, and the slowing of the heart's action made him suspect a lesion of the medulla, and with the hope of making this lesion extensive enough to be recognized, he determined to inject a much larger quantity of water than he had previously employed in the experiments. 100 grammes (℥ 3 +) were injected rapidly by means of a syringe screwed into a small hole made near the centre of the right side of the skull. At the autopsy an extensive rent was found in the median line of the floor of the 4th ventricle, a rent evidently produced by a force acting from within outwards, and the aqueduct of Sylvius and the central canal of the cord were largely dilated.

When we recall the definite plan of the experiment, and note that the dog thus sacrificed was "no. 32 *bis*," the exultation which M. Duret manifests in the next paragraph seems quite as justifiable as that which sent Archimedes, naked, through the streets of Syracuse, and gave all languages a common cry of triumph. The mode in which the lesion had been produced was apparent: the pressure upon the surface of the hemispheres had forced the cerebro-spinal liquid contained within the lateral ventricles out through the only channel open to it, the aqueduct of Sylvius, into the 4th ventricle, and the latter, not being able to discharge the liquid through the minute foramen of Magendie and the central canal of the spinal cord as rapidly as it was received, was subjected to a dilating pressure sufficient to rupture its walls. In order to eliminate a possible source of error, the direct passage of the injected liquid into the ventricle, the syringe was filled with a thick solution of gelatine instead of water, and the experiment was repeated. The result was the same: muscular rigidity, arrest of respiration, death; and at the autopsy the coagulated gelatine was found solely between the dura mater and the bone. There was a small amount of blood in the cavity of the arachnoid at the base of the brain, the aqueduct of Sylvius was enormously dilated and torn, the central canal of the cord was dilated throughout its entire length, and the floor of the 4th ventricle and the restiform bodies were covered with hemorrhagic spots.

It is too evident to escape the notice of any one that an experiment of this kind, however interesting and valuable it may be from some points of view, cannot be considered an experimental reproduction of any traumatism inflicted upon the skull. The amount of the injected liquid was so great that the compression exerted by it was far beyond that which could be produced by any blow unaccompanied by a crushing fracture. It could serve only to show the manner in which and the point at which a certain much less severe effect might be produced. Granted that the sudden passage of the contents of the lateral ventricles into the fourth ventricle may cause rupture of the latter, it remains to be shown whether a blow upon the skull can cause this passage, and, if it can, by what means; and here we must reverse the Cartesian order followed in this instance by M. Duret, and show what the blow actually does before we try to show what it ought to do, and how it ought to do it. It is not difficult to find material for our

purpose; the book is filled with records of experiments, and we take one, almost at random, from page 47. The dog, a long-haired, blind-man's dog, which had already served for one experiment, but whose health was completely re-established, as the meticulous chronicle informs us, received upon the forehead a blow delivered with violence enough, it was hoped, to kill it. The hope was not ill-founded; the animal remained comatose for thirty-six hours and then died. As the case is also a striking example of the general phenomena ascribed by the author to cerebro-spinal shock, a brief account of the symptoms may serve to show what he includes under that term. Before the experiment the dog's pulse was 100, respiration 24, and rectal temperature 38.8° centigrade. The blow, which was given at 9 A. M., was followed instantly by complete loss of consciousness, rigidity of the muscles, flow of blood from the nostrils, and involuntary defecation. During the first two minutes there were but three respirations and thirty pulsations. During the 4th minute four deep, difficult, stertorous respirations; pulse slow (12) and full; slight agitation of the limbs and tail; the respiration grew more rapid until the 8th minute, after which it remained at 32 until about the 25th minute when it was observed to have quickened to 42 with occasional arrests lasting for from 15 to 30 seconds. The pulse was 70, full and strong, each inspiration being marked by from two to four beats more feeble and rapid than the others. The thermometer placed in the rectum marked at the 6th minute 39.8°, at the 12th 39.2°, at the 25th 38.6°, and at the 60th 37.6°. The rigidity of the limbs, interrupted by occasional twitchings, especially of the muscles supplied by the facial nerve, gradually diminished and gave place to complete resolution during the second quarter of an hour. The respiration continued difficult and stertorous during the day, varying between 16 and 24; the pulse (including the rapid beats during each inspiration) was 80–90. The temperature at 5 P. M. was 34.2°. The next morning the animal was still unconscious; respiration 32, stertorous, pulse 90–100; temperature 38.8°. Resolution, pupils punctiform, sensibility obtuse, but reflex sensibility preserved He remained in this condition during the day and was found dead the next morning. The autopsy disclosed a fracture on each side beginning above the orbital arch, extending through it to the temporal fossa, and ending on the left side in the centre of that fossa, but curving inwards on the right towards the sella turcica. On the left was a small lenticular clot between the dura mater and the bone; the cavity of the arachnoid over the convexity of the right hemisphere contained a layer of blood not more than 1 millimetre in thickness. Both hemispheres were greatly congested throughout, "evidently the first stage of a generalized encephalitis following concussion." Ecchymoses in the sulci between the convolutions, and under the pia mater on each sphenoidal lobe. The ventricles were filled with reddish serum; there were five or six small hemorrhagic spots in the upper third of the floor of the fourth ventricle, the medulla oblongata was greatly congested and softened, and its surface of section showed minute hemorrhagic spots each surrounded by a zone of softening. The central canal of the cervical portion of the spinal cord was dilated with softening and punctiform hemorrhages in the gray substance of its walls.

We must distinguish between the early and late lesions, those which are the immediate consequence of the blow, and those which are due to the subsequent inflammation. Among the first are the extravasations of blood on the surface and in the bulb; it is plain that the latter organ was affected

by the shock although the blow fell upon the forehead ; and the dilatation of the central canal, corresponding to that observed in the first experiment mentioned, may be taken as a proof that in this case also the contents of the lateral ventricles were driven violently into the fourth ventricle, and were one at least of the causes of the extravasations found at the upper portion of its floor.   Repetitions of the experiment, with blows of different force, and falling upon different regions of the skull, were made by M. Duret with objects and results which we must here pass by without description, but from which we may draw one inference not drawn by him. The rupture of vessels on the outside of the bulb, and the greater facility with which the characteristic lesions of the fourth ventricle were produced when the blow fell upon the forehead or even the occiput than when it fell upon the side of the head, would indicate some other mechanism than simple compression of the hemispheres forcing out the contents of the ventricles.   A portion of this objection has not escaped his notice, and he seeks to explain the less effect of blows in the transverse axis by the action of a *cône de soulèvement*, an elevation of the skull produced by its elasticity at the point immediately opposite that at which the blow was received, and corresponding to the *cône de dépression* at that point. He thinks that the sort of vacuum thus formed solicits the liquid contained in the subarachnoid space and thus diminishes the effect of the cône de dépression.   When a blow is delivered upon the vertex no cône de soulèvement can be formed because the opposite point rests upon the spine and cannot yield.   It may be that all this is true, but there is nothing in the book to prove it, and it is not easy to believe without a demonstration that the elasticity of a globular body is manifested only in a change of form at the point opposite that at which the original impulse is received.   As for the blow upon the vertex, the assumed absence of the cone of elevation can hardly be accounted for by the reason given, for if it could not be produced by its own actual projection, it could by a relative projection, that is by the rebound of the rest of the skull, or, as any one who has squeezed an orange or a rubber ball must have observed, its absence would be compensated for by the increase of all the transverse diameters.   It seems a simpler and more probable explanation, if we may hazard one, to infer that a more complete or uniform compression is produced by a blow upon the forehead, since it acts directly upon both sides, and that its effect is increased by the fact that the movement of the wave being in the axis of the blow it is augmented by the direct application to it of the force.

It is frequently noted in the autopsies that clots of considerable size were found on the outer surface of the medulla oblongata, and M. Duret explains these, as he does all others on the surface, by the action of the peripheral wave,[1] that occupying the subarachnoid space.   This wave, he thinks, distends the meshes of the space and thereby ruptures the vessels, just as a hypodermic injection sometimes ruptures those of the subcutaneous cellular tissue.   That this action is exerted by the wave is proved beyond a question by some of his experiments, but it seems as if the generalization had been carried a trifle too far, and that the author's legitimate pride in the force discovered by him had led him to overlook a not unimportant adjuvant. The disparity between the extent of the peri-bulbar lesions and others

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[1] We use the term *wave* merely as a convenient one for expressing the movement of the liquid from one point to another; it must be remembered that the movement, in the subarachnoid space at least, takes place through a multitude of small channels, and is therefore a collection of streams rather than a single wave.

likewise produced at a certain distance from the point receiving the blow leads one to look at once for a special reason. No such reason is presented by the sub-arachnoid space, its meshes are no larger, its capacity for distension even less than elsewhere, there is no reason to think that the liquid has a special tendency to collect there, on the contrary the distensibility of the neighbouring occipito-atlantoid ligament seems to furnish a sort of local safety-valve. What then can be the reason ? The attention that is not pre-occupied falls at once upon the gross anatomical differences, the stalk-like form of the medulla, its position in the axis of the blow and at the very outlet of the skull—all point to a reason less recondite than that contained in the waves of the cerebro-spinal liquid. The medulla oblongata seems to be so exposed to the receipt of direct violence that it might almost be used as an argument against the doctrine of the survival of the fittest. It must be noticed too that the extravasations are found upon its anterior surface, there where it rests upon the basilar process at the very point where the impulse of the direct force transmitted through the bones would be received.

But these are only objections of detail; they leave this main fact that lesions are produced by peripheral and ventricular waves of the cerebrospinal liquid unshaken. We have yet to consider the manner in which the waves are produced and propagated. The first of the essential elements in this consideration is the elasticity of the skull. We use the term elasticity advisedly, for the results in all the experiments were obtained without the aid of depressed fractures. The elasticity of the skull scarcely needs a demonstration. Almost every one knows that an empty skull let fall upon the pavement rebounds to the hand that dropped it; but the measure of the elasticity, the extent to which it yields, and therefore the measure of the compression which the blow exerts, is not so well understood. A single experiment puts it in a very clear light. Félizet (p. 28) filled a skull with melted paraffine, cooled it, and let it fall from a height of $2\frac{1}{2}$ feet. The globe of paraffine was then removed and showed at the point corresponding to that which received the blow a flat circular surface more than an inch in diameter, and representing a depression of one-third of an inch, or in cubic measure .13 of a cubic inch, a very considerable amount for so moderate a blow. To understand its effects upon the contents of the skull we must turn to M. Duret's description of the disposition of the cerebro-spinal liquid.

The cerebro-spinal liquid is collected in two irregular masses, the peripheral and the ventricular, communicating with each other by a narrow opening at the lower end of the fourth ventricle, the foramen of Magendie. The arrangement of the ventricular portion is comparatively simple ; it is contained within the ventricles and the central canal of the cord, and its different portions communicate quite freely with one another. In order to understand the action of this portion in producing the lesions of cerebrospinal shock we must bear in mind the fact that the great part of it occupies the lateral and third ventricles, and communicates with the smaller part in the fourth ventricle through the aqueduct of Sylvius or iter e tertio ad quartum ventriculum.

The disposition of the peripheral portion is much more complex ; it occupies the subarachnoid space covering the brain and cord, a space which, beginning in or continuous with the so-called lymphatic sheaths of the fine arterioles distributed to the substance of the brain, the *gaînes de Robin*, expands into larger channels in the sulci between the convolutions,

and finally into sacs of different sizes at the sides and base of the brain. It is continuous also with the sheaths of the vessels and nerves of the organs of special sense. This arrangement is happily compared by M. Duret to a system of brooks, rivers, and lakes, the principal rivers being the channels in the fissures of Sylvius and Rolando, and the lakes the *sylvian* at the lower extremity of the fissure of Sylvius, the *central* at the base of the brain, the *inferior cerebellar* behind and below the cerebellum, and the *terminal* at the lower end of the spinal cord. The communication with the ventricular portion is through the foramen of Magendie, between the inferior cerebellar lake and the fourth ventricle.

The liquid is produced by exudation from the vessels, and its tension is greater than that of the air, being equal, according to Leyden, to that of a column of water 10 centimetres high, and rising during violent respiration to 14 or 15 centimetres. Of the many interesting points connected with the functions of this liquid we have space to mention only one, namely, the manner in which it protects the brain from injury by changes in the amount of blood supplied to it. It is apparent that as the cavity of the cranium is always completely filled, and its walls are not distensible, the brain would be compressed at each beat of the heart by the additional amount of blood forced into it, unless provision were made for a simultaneous withdrawal of a portion of the contents of the cranium. This provision is found in the veins and in the distensibility of a portion of the walls of the spinal canal. The cerebro-spinal liquid receives the impulse of the pulsation, gives way before the dilating arteries, presses upon and compresses the veins, and distends the membranous portions of the spinal canal. This can be clearly demonstrated by the graphic method at either end of the canal. If the occipito-atlantoid membrane is exposed by division of the muscles of the back of the neck, traces can be obtained showing the effect upon it of every pulsation and respiration.

As the sub-arachnoid space is not an empty sac like the cavity of the arachnoid, but is generally occupied by a delicate fibrous reticulum supporting the bloodvessels, in the meshes or intervals of which the liquid is contained, every sudden or extreme dilatation is attended by the risk of rupture of the filaments and vessels, and of consequent extravasation of blood. The same effect is produced, although by a different mechanism, in the minute prolongations of the cavity along the arterioles; when the peri-vascular sheaths are distended by the afflux of the liquid under the impulse communicated by a blow, the arterioles are compressed directly by the liquid, and the capillaries indirectly by pressure through the brain substance; then if the pressure is suddenly released the vessels burst by the unopposed tension of their contents. This has no special pathological significance, but it was very prettily shown by an experiment devised with this object. Pressure was gradually made upon the brain by an injection of wax, and maintained until the death of the animal; very few and slight hemorrhagic legions were found. The experiment was then repeated, and when the same degree of pressure had been obtained it was suddenly diminished; the tissue of the brain was then found to be filled with small hemorrhagic foci.

The effect of this pressure upon the respiration, and the dependence of the respiratory phenomena upon the cerebro-spinal liquid, are clearly shown by the experiment recorded on page 79. After section of the muscle of the back of the neck, and exposure of the occipito-atlantoid membrane, an injection of 15–20 grammes of wax was made rapidly through an

opening in the anterior portion of the vertex. This was followed imme-
diately by very violent opisthotonos and total arrest of respiration. After
the animal had remained a minute and a half in this condition the bulging
distended occipito-atlantoid membrane was punctured with a small trian-
gular needle, and the liquid allowed to flow out; the animal immediately
began to breathe again at the rate of sixteen respirations per minute.
Two or three minutes later the respiration again ceased, and it was ob-
served that the liquid was no longer flowing, and that the membrane was
again bulging; a second puncture was followed by a second renewal of
respiration; then, after three or four minutes a third arrest, third punc-
ture, and permanent re-establishment of the breathing.

As the cerebro-spinal liquid is distributed so widely it is easy to under-
stand that blows acting upon and through it should produce lesions at
every part of the brain, although their severity at the different points
would vary according to the facility with which the liquid could pass from
one part of the sub-arachnoid space to another. While it is true that, in
accordance with the well-known hydrostatic law, pressure upon an inclosed
body of water will be felt equally at every point on the inclosing surface,
the character and size of the channels of communications between the dif-
ferent parts of that space, if its walls are at all distensible, will modify
the effects of that pressure by affecting the facility with which the liquid
passes from one part to another.

This fact, while referred to indefinitely by M. Duret at one or two
places in his book, does not receive from him the attention which it de-
serves, for by it alone can, among other things, the bursting pressure
exerted within the fourth ventricle be explained. As that cavity commu-
nicates, through the foramen of Magendie, with the neighbouring sub-
arachnoid space, the pressure within and without the ventricle when the
liquid is at rest is the same, and the only effect of increase of that pressure
would be increased compression of the bulb between the two bodies of
liquid, as a piece of iron is compressed between the hammer and the anvil.
But, as the communication through the foramen is insufficient to accom-
modate a wave of liquid (as shown by the rupture of its walls), and as
similar obstacles prevent the timely arrival at the posterior cerebellar lake
of the peripheral wave originating at the cone of depression, the un-
balanced pressure within the ventricle produces rupture of its wall, just as
a rubber ball is burst by a too vigorous attempt to force its contents
through a small orifice. The distensibility of portions of the wall of the
spinal canal affords a space into which the liquid contents of the cranium
can pass, and the conditions of the problem, therefore, are not those of
simple pressure, but the much more complex ones of liquids in motion;
and although the effects of variation in pressure are shown in some of the
lesions, the most important ones are those produced by the waves.

The lesions found on the convexity of the hemispheres are hemorrhages
of greater or less extent from the vessels of the meninges, and, when the
bone has been broken, of direct laceration. M. Duret thinks that when
the bone has not been broken, the lesions found under the point where the
blow was received are the result not of direct violence, but of the sudden
springing back of the corresponding portion of bone after it has been de-
pressed; into the vacuum thus formed the return wave rushes, and tears
up the meningeal vessels. He rejects also the old explanation by contre-
coup of the lesions at the opposite side of the skull, and substitutes one
similar to that just mentioned, the vacuum being formed by an elevation

of the bone corresponding to the depression produced at the opposite point by the blow (*cône de soulèvement*). We have already remarked that there is no proof of the existence of such an elevation, and, therefore, the argument based upon it cannot be accepted. The hemorrhages are in the form of ecchymoses under the pia mater, staining of the liquid in the sulci by rupture of the small vessels in the arachnoid meshes, and in small miliary foci due to rupture of the capillaries by changes of pressure in the lymphatic sheaths.

At the base of the brain the lesions are frequent and extensive, consisting of hemorrhages into the central and sylvian lakes, and sometimes, by rupture of its visceral layer, into the cavity of the arachnoid. Similar lesions are sometimes found around the bulb, and to a greater or less distance down the spinal cord.

The lesions within the fourth ventricle have already been described in part; they comprise extravasations of blood of greater or less size, most frequent at the lower angle, and next at the upper angle of the ventricle. These are sometimes extensive enough to give rise to the formation of a distinct clot, but most commonly are only miliary foci. It is worthy of note that a **V**-shaped mass of gray matter lying near the lower angle, and thought to be the origin of the pneumo-gastric nerve was frequently occupied by some of these foci. The foramen of Magendie is frequently torn, and in very severe cases the floor of the ventricle may be split. Interstitial hemorrhages are often found in the substance of the medulla and pons.

Finally, hemorrhagic lesions are sometimes produced at different points in the spinal cord. The case reported on page 102 is an interesting example of traumatic locomotor ataxy caused by a blow on the side of the head, the lesion consisting of an extravasation under the pia mater covering the posterior columns of the cord at the brachial enlargement.

The *symptoms* produced by cerebro-spinal shock are manifested in the muscles, respiration, circulation, and intelligence. The shock is followed instantly by an intense spasm and rigidity of the muscles, a spasm which is so general that it must be looked upon as reflex, as a manifestation of an irritation of sensitive centres, of the restiform bodies, according to M. Duret. This rigidity disappears in the course of a few minutes, and is followed, according to the severity of the shock, either by a return to the normal condition, or by complete resolution lasting until death. Agitation or paralysis of different groups of muscles is an indication of local lesions to be referred to hereafter.

With this spasm of the muscles of relation is associated a similar condition of the muscles of organic life, notably those of the arteries. These vessels contract, the tension of the blood contained in them is increased, and as a consequence of the obstruction which this offers to the passage of the blood through them, the tension in the veins is greatly diminished. In an experiment upon a horse the tension in the jugular vein sank from 16 centimetres to 4 at the moment of the shock, an enormous difference, which plainly shows how complete the anæmia of the brain must have been. This spasm is followed by a general dilatation of the vessels, the result either of fatigue or of inflammatory action set up by the numerous hemorrhagic lesions. The effect of these variations in the blood supply is seen in the functional disturbances of the brain; the primary anæmia causes complete loss of consciousness, which is prolonged by the succeeding hyperæmia, and may last, if a generalized inflammatory process is set up, until death.

We cannot follow the author through his examination of the many interesting consequences and incidents of this spasm, but will mention only the changes produced in the temperature which are ascribed by him to it. Starting with the theory of the profound antagonism between the vessels of the peripheral and of the visceral circulation, as established by the researches of Claude Bernard and other physiologists, he claims that, while there is arterial contraction in the brain and on the surface, there is arterial and capillary dilatation in the abdominal viscera, and this dilatation is marked by local rise of temperature. The facts are that the rectal temperature rises to 39.5° or 40° centigrade immediately after the shock, or even to 41° or 42° in very severe cases. It subsides promptly, falls below the normal, and remains there until death or the beginning of the inflammatory stage. This theory of visceral dilatation does not harmonize however with the preceding theory of generalized spasm; and as we know that muscular action will raise the temperature of the body, and paralysis will lower it, it seems more reasonable to ascribe the rise of temperature to the intense action of the muscles, and its fall to the subsequent resolution which amounts practically to paralysis.

The contractions of the heart are at first precipitate, feeble, and incomplete, and soon become natural if the blow has been light. But if the blow is violent the pulse becomes slow, strong, and tense; this corresponds to the period of contraction of the arteries. If the blow is still more violent the period is marked by a dicrotism during the inspiratory acts that may be mistaken for rapid and feeble pulsations. When dilatation succeeds the contraction of the arteries the pulse remains slow, but is soft instead of tense; and, if finally the inflammatory stage is reached, the pulse becomes rapid.

The changes in respiration present five stages. The 1st is that of spasmodic arrest, and is common to both slight and severe shocks. It lasts only two or three minutes, and is followed by the stage of primitive acceleration which lasts fifteen or twenty minutes, and is the result of direct irritation of the respiratory centres. The 3d stage, that of irregularity and intermittence, is found only after severe shocks, and is due to lesion of the pneumogastric nerve itself, or of its origin in the gray matter at the lower angle of the fourth ventricle. The 4th stage, that of slowing, is marked by fulness and slowness of inspiration, followed without any interval by short expiration. The 5th stage is that of secondary inflammatory acceleration. Stertor is common in the severe cases, and is ascribed to traumatic paralysis of the muscles of the soft palate. In some of the recorded experiments it appears, however, to have been only an incident of the general muscular resolution; and in two, pages 109 and 130, it existed only during short periods of insensibility.

Two experiments were made with the view to determine the points in the 4th ventricle, irritation of which would excite spasms of certain muscles, such as had been observed in some cases, especially those of the eyes, lips, and jaws. The results with reference to these points were in the main confirmatory of those obtained by other physiologists, but incidentally others were obtained which strikingly corroborate the author's explanation of the relations between the lesions and symptoms observed in the other experiments. The occipito-atlantoid membrane of a dog was exposed, a director passed upwards through it, and its point pressed against different parts of the floor of the ventricle. Not only was the expected action of the different muscles excited, but general rigidity, opisthotonos, arrest of respira-

tion, unconsciousness, and loss of reflex sensibility were also produced. These experiments may be considered a positive proof of the causative relation existing between the lesions and symptoms observed in the other cases, and the previous experiments are an equally positive proof of the agency of the cerebro-spinal liquid in the production of the lesions in these other cases. The experiments of M. Duret have made it necessary for us to revise our opinions upon many cerebral traumatisms, and he deserves great credit for having discovered and demonstrated a factor in their production which has hitherto been overlooked.

The capital point in this discovery is the fact of the passage of the contents of the lateral ventricles into the fourth ventricle under the influence of pressure exerted upon the hemispheres, and this fact is to be taken into account in apoplexies as well as in traumatisms, for, as is shown in another part of the book, the injection of a small amount, 3 to 5 grammes, of a non-absorbable liquid into the substance of the brain or upon its surface is sufficient to produce the symptoms and lesions of cerebro-spinal shock; and an analysis of the symptoms of apoplexy shows a remarkable similarity, if not an absolute identity, with those above described. There is the same loss of consciousness, and its explanation by vascular spasm followed by dilatation is supported by post-mortem evidence. There is also the short convulsive stage (irritation of the sensitive tracts of the bulb), followed by complete resolution, with loss of both absolute and reflex sensibility. The pulse shows the same changes, at first slow and filiform, then natural but weak, then accelerated; and the analogy between the respiratory phenomena is particularly close. Finally, the temperature is also lowered, and rises again, of course, if the inflammatory stage is reached, and probably would show the short primitive rise corresponding to the spasm of the muscles if the observation could be made. Its short duration, ending perhaps before the arrival of the physician upon the scene, and the necessity of measuring it in the rectum are sufficient reasons for its having hitherto escaped observation. M. Duret claims that the mechanism by which these symptoms are produced is the same in both cases, namely, the sudden passage of the contents of the lateral ventricles into the fourth ventricle and the consequent irritation of the restiform bodies; and he intimates in a footnote that this theory has received the support of Prof. Charcot. The statement, however, certainly needs to be accompanied by a limitation, one which doubtless was not overlooked by him, but is not expressed in set terms. The explanation can be true only of rapid hemorrhage from a vessel of considerable size, for the compression exerted by a slight hemorrhage, or by one occurring slowly, would be insufficient in amount or in rapidity of production to exert the mechanical action essential to this theory. This absence of the lesions and symptoms of cerebro-spinal shock, when the compression is increased slowly and gradually, is plainly shown in the histories of some of the experiments recorded in the chapter devoted to the examination of the mechanism and influence of compression.

It does not seem desirable to enter as fully into the author's examination of the effects of compression of the brain as into that of the cerebro-spinal shock, and we shall therefore confine ourselves in what follows to the more prominent results of this examination, leaving the others to be considered when the second or clinical part of the book shall have appeared.

It follows, of course, from what we have already learned of the cerebrospinal liquid, that any compression of the brain, any diminution of the

capacity of the cavity of the cranium, exerts an effect at all points occu-
pied by that liquid, an effect dependent upon the degree of increase of its
tension. This increased tension diminishes the calibre of the vessels (by
pressure upon them) and the amount of blood which passes through them
in a given time, and the results of this local anæmia are shown in the
disturbance of the functions of the cerebrum and medulla. If the tension
of the cerebro-spinal liquid becomes equal to that of the arterial blood, the
circulation is arrested and the individual dies. This equality of intra-
and extra-vascular tension cannot, however, be produced by an escape of
blood into the cavity, unless the vessel ruptured is a very large one; and,
moreover, the vascular spasm produced by the irritation of the sensitive
nerves or centres increases the arterial tension so much (from 8 centimetres
of mercury to 22 or even 28), that an equal extra-vascular pressure is proba-
bly produced only in experiments, and never in diseases or traumatisms.
This increase of tension is marked by notable slowing of the pulse, except
when it is great enough to cause death promptly; in this latter case the
pulse is accelerated, usually to such a degree that it cannot be counted.
The other symptoms, which become more marked as the pressure in-
creases, are somnolence, dulness of intellect, and diminished sensibility or
complete coma, according to the pressure. This increase of tension cannot
be estimated either clinically or post-mortem, and in its place we have to
consider the size of the clot, and decide from that whether the symptoms
observed during life were due to compression or to some other pathological
influence.

With the view of determining the relations between increased tension
and the amount of compression, M. Duret made a number of experiments,
consisting in the injection of wax into the arachnoid cavity or between
the dura mater and bone, and found that in the latter case a clot equal in
size to one-twelfth of the capacity of the cranium would cause coma and
death in a few hours, while in the former case the clot produced these re-
sults only when it became equal in size to one-sixth or even one-fifth of
the capacity of the cranium. In attempting to utilize these facts in clini-
cal observation, however, we must remember that they apply only to *early*
symptoms and to cases in which there is no concomitant lesion of the nerve
centres; for the cause of the later results is found in the subsequent inflam-
mation and changes in the circulation.

The symptoms produced by pressure exerted by increased tension of the
cerebro-spinal liquid may be usefully classified according to their origin in
the hemispheres or in the medulla. Those pertaining to the former are
muscular weakness and dulness of the intellect and sensibility, varying
directly in intensity with the pressure. The medulla and spinal cord being
the centres of reflex sensibility, pressure upon them is manifested by dul-
ness or abolition of reflex sensibility, for which touching of the cornea is
the best test, because that organ is under the control of the medulla and is
the last to lose its sensibility, both because it is near its nerve centre and
because the vascular supply of the medulla is such that it resists pressure
longer than any other part. This resistance of the medulla to traumatic
influences led Charcot, in imitation of Haller, to call it the *ultimum
moriens* of the nerve centres, and its possession of this quality is amply
justified by the importance of the functions over which it presides—circu-
lation, respiration, and animal heat. As a rule, pressure causes no change
in either of these three functions until after the tension of the cerebro-spinal
liquid has become nearly equal to that within the arteries; then both pulse

and respiration grow slow, and the temperature of the body falls.   If the tension is increased until it equals or exceeds that of the arterial blood, the temperature falls still lower and the respirations grow less frequent; but the pulsations suddenly become so rapid that they cannot be counted, and the animal dies in a few moments.   A positive sign of obstruction to the circulation of the medulla is furnished by the character of the respiration (slow and deep inspiration with more rapid expiration) and the occurrence of three or four rapid pulsations during each respiratory act. (M. Duret does not seem to be quite sure of this observation, for he speaks of it in other places as a "dicrotism which might be mistaken for rapid pulsations.")   The predominance of symptoms referable to the medulla is characteristic of intra-ventricular pressure (extravasations).   In contrast to this, pressure upon the anterior surface of the hemispheres, if moderate, quickens the respiration and pulse; if greater, it slows the respiration, and after a longer interval the pulse also.

We need not follow the author in the parallel he draws between the symptoms of cerebro-spinal shock and of compression; for, although interesting, it is necessarily incomplete and must await a fuller development in the clinical portion of the work which is to follow, and we must close our review of this portion with a consideration of the important symptoms produced by lesions of the dura mater.   Their importance is due to the fact that this membrane is well supplied with sensitive nerves coming mainly from the fifth pair, the physiological action of which can be easily excited by traumatisms of the skull or by inflammatory processes within it.   The manifestations of this action complicate the symptoms due directly to the primary lesion and render an accurate diagnosis difficult, because some of them are also symptomatic of lesions of the brain substance. Without entering into any of the details of the experiments, we may give briefly the conclusions arrived at.   As the nerves are nerves of sensation, pain is, of course, a frequent symptom, and the others are those of reflex irritation manifested by spasms and contractures in the muscles, by modifications of the respiration and pulse, and by vaso-motor changes in the eyes and brain, with consequent somnolence or coma.   The spasms and contractures of the voluntary muscles are situated sometimes upon the same side as the lesion, sometimes upon the opposite side; they have a tendency to become more or less generalized, and involve the neighbouring groups of muscles, and never have the localization and voluntary appearance of contractions induced by lesions of the cortex.

The diagnosis of lesions of the dura mater, their differentiation from those of the brain substance itself, has a positive and practical importance, because they may be due to a depressed fragment of the inner table of the skull or to a clot of blood between the dura and the bone, and therefore amenable to surgical treatment.

If we compare them with the symptoms of the lesions accompanying cerebro-spinal shock, we find that in the latter a slight lesion, e. g., a superficial extravasation, gives rise at first to symptoms indicating exaggerated functional irritability of the corresponding part of the brain, that is, to localized muscular twitchings.   If the lesion is more severe, if it is destructive, it causes paralysis; and in both cases, when the lesion involves the cortex, the symptoms appear on the opposite side of the body.   Permanent contraction of different muscles appears only secondarily, after the lapse of one or more days.   It is at first limited to the muscles corresponding to the injured nerve centre and to the neighbouring groups, but may become generalized and even affect both sides of the body.

The symptoms produced by lesions of the cortex in the primary stage are thus seen to be entirely distinct from those due to lesions of the dura mater; in the former they occupy the side of the body opposite to the lesion; in the latter they occupy the same side: paralysis may occur in the former but not in the latter; in the former, spasmodic muscular action is distinctly localized and has a sort of voluntary character, while in the latter it is generalized and involuntary in appearance.

The permanent contractions of the second stage are attributed by M. Duret to subsequent irritation of the dura mater, and are therefore not to be distinguished from those produced by lesion of the dura alone. There is, however, one variety, and an important one, of muscular contractions excited by injury to the substance in which the dura mater plays no part; the irritation is propagated directly from the seat of the lesion to the medullary centres by the aid of the white motor fibres of the hemispheres. In this case the symptoms are always those of epileptiform attacks beginning usually in the muscles which correspond to the brain centre first affected.

The two remaining chapters of the book are devoted to the part played by the meningeal vessels in cerebral traumatisms, and to a résumé of the relations between the lesions of the different parts of the encephalon and particular symptoms, including a few contributions to the study of the localization of motor centres and the propriety of surgical interference based upon them. There is nothing in these chapters that requires especial mention here, and we now leave the book with the conviction that it is well worth study by all, and that as a product of accurate experimentation and cautious inference, it is not only a valuable contribution to the surgery and physiology of the brain, but also gives the assurance that French science will find in the new ranks men not unworthy to take the place of those who have made her past and present illustrious.

L. A. S.

Art. XXIII.—*A Clinical History of the Medical and Surgical Diseases of Women.* By Robert Barnes, M.D., Lond., Censor of the Royal College of Physicians, Obstetric Physician and Lecturer on Obstetrics and Dis. of Women to St. George's Hospital, etc. Second American from the second and revised London edition. 8vo., pp. 784. Philadelphia: Henry C. Lea, 1878.

The American profession will receive with great pleasure this second edition of Dr. Barnes's excellent book. Dr. Barnes, in his brief visit to the United States in our Centennial year, made many acquaintances, many friends, and they will be glad to have him address them again, even though it be by the printed page, and from the other side of the Atlantic. Moreover the book especially commends itself to American readers by its recognition of American works and workers in gynæcology, and by its graceful dedication to one whom the profession of this country hold in such high honor, Dr. Fordyce Barker.

The title page states that this edition is from the second and revised London edition, and Dr. Barnes, in his preface, refers to the revision as having been "conscientious." But the thoroughness of this revision—its

careful minuteness and completeness—will hardly be recognized by any reader who does not collate the two volumes, comparing page with page and sentence with sentence. Such collation will show that hundreds of changes have been made ; here new matter introduced, there old eliminated ; alterations in order and connection ; some old illustrations omitted and many new ones inserted ; verbal or other variations of individual sentences, modifying the thought or presenting it in clearer and more condensed form—these are among the characteristics and results of a revision which the author has justly termed conscientious.

Having so recently presented a review of the first edition of this work, our observations at this time will be chiefly occupied with the new matter and with some parts of the old not referred to in that review.

The first chapter is devoted to the anatomy of the external and internal organs of generation. Several new illustrations are introduced, nearly all from Sappey ; one is credited to Kundrat, but we believe the name of our St. Louis friend, Dr. Geo. J. Englemann, should also be associated with it. Upon the authority of Sappey, the peritoneal investment of the ovary, which still holds so firm a place in the minds of some, is rejected ; we believe, however, that Waldeyer is the authority to be referred to in this connection. So, too, the ovarian tunica albuginea is a thing of the past. Why not also discard the words Fallopian tubes, replacing them by oviducts, as briefer, and because tube is no more the equivalent of *tuba*, a trumpet, than a popular designation of the menstrual flow, *flowers* is of *fluor*.

The *carunculæ myrtiformes* remain the products of the ruptured hymen, though there is excellent authority for the statement that these little bodies are quite independent of the hymen.

Dyspareunia, second chapter, p. 72, still holds its place ; though we believe we conclusively showed that Sophocles attached no such meaning to the primitive as is given the derivative, and that, therefore, the definition of the word as used by Dr. Barnes is constrained, arbitrary, and not essential. Nevertheless a word is needed to indicate difficult or painful sexual relations, and as Dr. Barnes expresses them by this term, its general adoption is not doubtful. Dyspareunia, too, is not lacking in euphony, and that is more than can be said of some other of the author's additions to the English language, such as *dyschezia !*

On page 73 the menstrual fluid is called a secretion, and on the next page we learn that " nearly the whole genital tract secretes mucus." Now is it not a wrong use of language to call the menstrual liquid a secretion ? Is it a secretion in the same sense, or in anything like it, that mucus, or any other glandular product, is ? The secretion theory of menstruation we were faithfully taught in our student days, but we supposed that such a view was of the past, both dead and buried, and the present use of the term secretion in such connection by Dr. Barnes and other teachers, is rather an accommodation than a strictly correct application ; nevertheless it may be misleading.

On page 94 Dr. Barnes refers to Dr. Emmet's extolling hot vaginal injections—one of the most valuable contributions to uterine therapeutics—but neither commends nor condemns the practice.

In considering the *varieties of watery discharges*, p. 86, Dr. Barnes remarks :—

" In one case, which was under my close observation, hydrorrhœa to the extent of a pint or more daily, occurred during the three latter months of gesta-

tion. This certainly came from the cervix. Other cases satisfy me that the cervical glands may secrete large quantities of watery fluid; and there is generally no necessity to seek higher up for the source. This copious secretion finds analogy in the occasional free secretion of water from the stomach, and in the profuse salivation of pregnancy. As I have shown elsewhere, the entire glandular system is rendered more active in pregnancy; and the increased vascular tension of this condition is relieved by discharges, sometimes at one point, sometimes at another. I do not think it is desirable to try active means to control these discharges, which are really of physiological significance. The only true remedy is the termination of gestation, which must be awaited with patience, unless serious constitutional impairment threaten."

On page 88, referring to the same subject, *i. e., watery discharges*, another important statement is made :—

"I have seen profuse watery discharge from the uterus and its neck in cases of retroversion and retroflexion of the uterus. Here we may infer that their glandular structure was unusually active, and that the vascular fulness was increased by the imperfect return of the blood by the veins, compressed or strangled by the malposition or distortion of the uterus. Certain it is that in one very marked case profuse watery discharge ceased with restoration of the uterus to its normal position."

The third chapter is a new one. It is a consideration of the symptoms of vesical and urinary, and of rectal disorders in relation to uterine and peri-uterine affections. Dr. Barnes very truly remarks that in the majority of cases where women complain of vesical disorder, the cause of the distress will be found outside of the bladder.

Retention of urine is the first topic discussed; and its symptoms, varieties, causes, diagnosis, and results fully presented. Then follow *ischuria, vesical irritability, cystitis, incontinence of urine, dysuria, abnormal excretions from the bladder*, and *malignant disease, primary* and *secondary*, of this organ. Under the head of abnormal excretions from the bladder, of course discharges of blood are considered. We believe an additional cause to those mentioned by Dr. Barnes of such discharge may be given, viz., the opening of a peri-uterine hæmatocele into that organ—but of this again. Six pages of the chapter are occupied with the second subject. Dr. Barnes, in the course of the consideration of it, gives the method of exposing the lower portion of the rectum to view, first devised and practised by Dr. H. R. Storer, but does not mention Dr. Storer's name.

This valuable chapter concludes with this important lesson :—

"One lesson will be drawn from the clinical deductions made in these studies of the relation of the bladder and bowel distress to disease of the neighbouring structures. It will be seen how impossible it is to pretermit close examination of the surrounding organs without serious risk of overlooking conditions that may be fatal if neglected, and which may be remedied if discovered. Whilst we are looking at the kidneys or the intestine, because they are disturbed in their functions, it may be the uterus or the ovaries that are in fault. We thus see how dangerous it is to practise in the spirit of pure specialism; how absurd it is to map out the body, and assign particular territories to particular classes of practitioners. It will be seen how intimately, how indissolubly that part of medicine which takes for its basis the particular study of the generative system in woman, is linked with the disorders of the alimentary, vascular, and nervous systems; that is, a pure specialty cannot exist. A more monstrous thing cannot be conceived."

The sixth chapter—*Pathology of the Ovaries and Menstruation with its Disorders*—shows several additions. Among these are a presentation

of the arguments against the ovarian theory of menstruation formulated
by Dr. Kesteven in 1849, "objections that have been taken up by several
German writers," says Dr. Barnes, and answers them satisfactorily or not
according to one's belief or disbelief in the aforesaid theory.   Believing
the theory, the reply is to the reviewer quite conclusive.   We cannot
see why conception should be a constant power in women and an inter-
mittent one in the animal world, and why she should be exempt from the
general law of periodical ovulation holding in that world.   We are in full
faith with Stoltz, when he asserts that menstruation is the external sign
of ovulation, and a consequence of ovarian excitement.   Sphygmographic
tracings are presented, showing the high tension preceding the menstrual
flow, and of that at the end of gestation, and then of the ordinary tension
after menstruation.   The views of Kundrat and Englemann to the effect
that the menstrual hemorrhage is a retrogressive process, under which the
superficial layers of the mucous membrane, having undergone fatty degene-
ration, are being exfoliated, are presented, but by no means endorsed.

In referring to the *menopause*, Dr. Barnes quotes with approval the
statement of Dr. Fordyce Barker, that a woman over fifty-five is past the
period of child-bearing.   Alas! for the collection of late pregnancies which
Tilt has given in *Change of Life*.   Alas! too, for the credibility of Pliny,
who states that Cornelia gave birth to Valerius Saturninus when she
was seventy years old; and of that of Renauldin, whom Raciborski cites
without contradiction or the slightest indication of skepticism, and who
asserted he knew a woman whose menstruation had ceased for ten or
twelve years, giving birth to a child when she was sixty-one.

Vicarious or *ectopic* menstruation retains its place.   Why not substi-
tute for the two words *xenomania*, proposed by Flamant more than fifty
years ago, a word quite as expressive as euphonious, and of as pure Greek
origin as *copræmia*?

In the conclusion of the chapter Dr. Barnes makes the following im-
portant remarks in reference to *masturbation*:—

"In association with this subject we cannot avoid allusion to masturbation.   I
must express my opinion that this subject has been invested with an atmosphere of
gloom and terror very much darker than cool observation warrants.   The history of
the countless celibates of both [*sic*] sexes will carry a just conviction to the reflec-
tive mind.   But, making all due allowance, the fact remains that the practice is,
in some instances, the result or the cause of the most deplorable nervous disor-
ders.   Experience has shown that the attendant disorder is not necessarily de-
pendent upon the condition of the external genital organs.   The vice has been
practised when the clitoris was small; it has been continued even after the clitoris
has been amputated.   It is kept up in some cases as in the scratching of pruri-
tus, by local inflammation.   I have seen the vulva intensely red, the epithelium
abraded, even ulcerated.   In extreme cases of erotic mania, and even in cases
less severe, I believe—the enthusiastic advocates of non-restraint notwithstand-
ing—that resort to the camisole is dictated by the soundest medical and ethical
laws."

In the eighth chapter, *Dysmenorrhœa*, Denman is quoted as having
anticipated one of the most commonly accepted theories of dysmenorrhœal
membrane.

Dr. Barnes is still a warm advocate for incision in mechanical dysmen-
orrhœa, and still holds that the obstruction is generally at the external os
uteri.   In the operation he still believes in scissors, especially in Küchen-
meister's, but devotes less space than in the former edition to the argument
against metrotomes.   He observes that—

"Immediately after the operation, or on the next day, it is generally useful to insert an intra-uterine pessary. I formerly used Wright's. I now prefer my galvanic coil pessary. Its flexibility adapts it more easily to the uterine conditions. It tends to straighten the uterus without injurious rigidity, and it stimulates development. Pregnancy has more frequently followed since I adopted this instrument."

In the next chapter, *Climacteric Disorders*, the author presents this explanation of the occurrence of organic disease at the menopause :—

"To a certain extent the healthily acting ovaries and uterus exert a protective influence; the decadence of the generative organs is attended with an increased proneness to the development of organic diseases, especially cancer. We may conjecture that the ovaries and uterus no longer exercising their normal functions and authority, morbid diatheses or organic defects hitherto latent or suppressed, break out, and absorb the remaining energies. Thus in another sense we discover that the menopause is a 'critical' or testing event."

Mr. Paget has shown that from forty-five to fifty is the age when scirrhous cancer of the breast occurs with greatest frequence, and a similar fact holds as to cancer of the uterus. But if the cessation of menstruation be a factor at all in the production of these results, ought they not to be observed in the case of women who cease to menstruate, as many do in some period of five years, say from thirty-five to forty, or from forty to forty-five, prior to the usual time of cessation? Dr. Barnes's explanation is ingenious, and seems quite rational, but probably cannot receive full credence until sustained and substantiated in the way we have suggested.

The tenth chapter is brief, and is upon the *Relation of Menstruation to Diseases*. There is scarcely any change in it from the first edition. Here, however, is an important new fact :—

"The modifications induced in the course of inflammation, acute or subacute, by menstruation, deserve careful attention. In several cases observed at St. George's Hospital, by Dr. Lacy, when my assistant, and myself, it was found that the temperature rose 1°, 2°, or 3° Fah. at every menstrual epoch. Hence we draw indication to moderate nervous and vascular tension at the menstrual epoch."

In the eleventh chapter we have presented various disorders of the ovary, such as displacements, inflammation, fibroid degeneration, tubercle, and cancer. In referring to prolapse of the ovary into the retro-uterine pouch, Dr. Barnes observes that he has frequently known the retroflected uterus to be mistaken for such displacement, and then says, " The diagnosis is made with certainty by passing the sound into the uterus. This done, if the mass is lifted away from the finger, and the fundus be felt supported on the sound by the hand above the symphysis, we know the case is retroflexion." Will not the finger in the vagina, and the direction of entrance of the sound into the uterine cavity, settle the question in so far as retroflexion is concerned, and might it not be well for less expert operators than Dr. Barnes to rest in the knowledge thus obtained without resorting to the further manipulations he advises?

The twelfth chapter is devoted to *Ovarian Cystic Tumours*. There are but two or three additions of new matter, and these relating to dermoid cysts.

The thirteenth chapter is chiefly occupied with *Ectopic* or *Retro-Uterine Gestation*. One might think that this was peculiarly a subject belonging to a work on obstetrics, and that a chapter on it in a volume upon diseases of women was itself a striking illustration of *ectopia*. But the explanation of its introduction is well given by Dr. Barnes when he

remarks, "For clinical purposes it is convenient to study ectopic gestation in connection with ovarian tumours. The diagnosis between them is often a pressing practical problem, upon the solution of which hangs the choice of the method of treatment."

In the course of the chapter Dr. Barnes gives just praise to Dr. Parry's work on *Extra-Uterine Pregnancy*, and narrates Thomas's interesting case of opening an extra-uterine fœtal cyst through the vagina by the galvano-cautery knife, remarking that the proceeding is worthy of adoption.

Twice in the course of the chapter the *placental souffle* is spoken of. This *souffle*, discovered by Mayor and Kergaradec, was believed by the latter to depend upon the utero-placental circulation, and therefore termed by him *placental*. But Dubois demonstrated—we quote the statement from Depaul, *Leçons de Clinique Obstétricale*—that the *bruit* thus named occurred in the walls of the uterus; that it was heard generally upon the sides of the uterus rather than at the fundus, the usual place of placental attachment; heard too after the detachment of the placenta, and therefore termed it uterine. Recent obstetric authorities generally no longer speak of the *placental*, but of the *uterine souffle*. However, when there is an extra-uterine pregnancy, of course this *bruit* cannot be called *uterine*, but, on the other hand, what right is there to call it *placental*?

The fourteenth chapter is upon the *Fallopian Tubes*, or, as we prefer, the *Oviducts*[1] and their *Diseases*. In referring to absence of the oviducts, Dr. Barnes does not mention an interesting fact stated by Boinet, that such absence is never observed except when there is entire absence of the ovaries. This chapter chiefly differs from the corresponding one in the first edition, by rearrangement and some condensation of the matter.

The fifteenth chapter is entitled the *Natural Course and Termination of Ovarian Tumours*. Among these terminations is twisting of the pedicle, the cyst rolling over on its side, as Dr. Barnes expresses it. Several cases of this accident are adduced, and among them a recent one from Knowsley Thornton, in which this revolution of the cyst had occurred three times. But in the well-known works of Gallez, *Des Kystes de l'Ovaire*, a case is alluded to in which the twisting of the pedicle had occurred five times.

Although the title of the chapter is as mentioned above, yet more than two-thirds of it is devoted to the *Diagnosis of Ovarian Tumours*. Here we find that much new matter has been added. In summing up the diagnosis between a fibroid tumour of the uterus and an ovarian cyst, Dr. Barnes states the case as follows:—

"I think it may be affirmed with some confidence that a large abdominal tumour is uterine, if we get a combination of the following conditions: 1. Absence of the *facies ovariana*; metrorrhagia; solidity of the tumour; descent of any considerable mass into the pelvis; deviation of the os uteri; distortion of the lower part of the uterus; and especially if, with the above, the sound travels to an abnormal distance, or, in other cases, when the vaginal portion is effaced, the os uteri forms the centre of a rounded hard mass resting on the pelvic brim."

Now let the reader turn to page 281 of the late Dr. Atlee's work on Ovarian Tumours, and see how the world's greatest ovariotomist, Spencer Wells, found this ovarian face where there was no ovarian, but a fibro-cystic tumour. Then, as to the second sign, in many cases of fibroid, especially

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[1] The French perpetuate the *trumpet* origin in giving the name *Trompes de Fallope*, but our word tubes is not the synonym of trumpets.

fibrocystic, tumours of the uterus, there is no metrorrhagia. As to the third, sometimes we find the fibroid or fibro-cystic tumour surrounded with copious ascites. Where too there is such ascitic effusion, there may be no descent of the tumour into the pelvis. We write thus because we have known the diagnosis so thorny and difficult from the failure of many of the signs mentioned by Dr. Barnes, and it is rarely we can get them all combined in a given case of doubtful uterine tumour.

On page 274, a drawing from Dr. Drysdale is given, representing the microscopic characters of the fluid from an ovarian cyst. On page 372, Dr. Barnes remarks, " Dr. Fordyce Barker informs me that the ' characteristic ovarian cell' was found in the sac of an extra-uterine gestation recently operated upon in New York ! Strong testimony is borne by Thomas, Byford, and Atlee to the general accuracy of Drysdale's test when applied by himself."

The *Treatment of Ovarian Cystic Disease* is the subject of the sixteenth chapter. Dr. Barnes does not seem to have much faith in the electrolytic treatment of ovarian tumours, a treatment of which was more heard a year or two ago than there is now. He observes, "Of uncertain efficacy in hydrocele, electrolysis does not promise much for the more difficult cases of ovarian cystic disease. Treatment in any case must be tedious."

Ovariotomy is given more space than in the first edition, and due importance and full descriptions of the antiseptic method are given. Keith is mentioned as a warm advocate of antiseptic ovariotomy, and stated as asserting that since he has operated under the carbolic acid spray, he "almost never drains." Considering the fact that he first suggested and so generally practised drainage, this testimony is peculiarly strong.

In speaking of the relative merits of silk and wire sutures for the abdominal incision, Dr. Barnes remarks, " It has happened to me to have to use both silk and wire in the same operation. I found that the wire sutures were more free from purulent tracts than the silver sutures." This conclusion is directly opposite from the one we heard Mr. Holmes announce, at St. George's Hospital, in the summer of 1864. A few days prior he had performed ovariotomy in the Hospital, using silver sutures, the patient died, and he observed at the *post-mortem* that in withdrawing the sutures, pus followed to the peritoneum.

Dr. Miner's process of enucleation of ovarian tumour is referred to favourably.

On p. 397 we find the following statement :—

" Walter F. Atlee, M.D., (*Amer. Journ. Med. Sci.*, 1877) relates a case, successful, in which he brought out as large a portion of the cyst as possible, clamped, cut it off, and carefully closed the wound behind it, trusting that the ovary would be sealed to the peritoneum of the ovary, and so close the peritoneal cavity." Upon referring to Dr. Atlee's report, he was not the operator, but Dr. Washington L. Atlee, was ; and the description given by Dr. Barnes of the sealing process, is certainly not what Dr. Atlee wrote, and is by no means easy of comprehension. Dr. Atlee's language is as follows : " Trusting that by a very careful attention to closing the abdominal walls accurately around the cyst by the interrupted suture, the necessary peritoneal inflammation which would result, would seal the peritoneal coat of the ovary to that lining the abdominal wall, and in a day or two seal up the general peritoneal cavity."

Vaginal Ovariotomy, Dr. Thomas's operation, and *Normal Ovariotomy*, Dr. Battey's, are briefly referred to on p. 403. The latter is considered less briefly on a subsequent page.

In referring to drainage after ovariotomy, Dr. Barnes states that " J. F. Miner (*Buffalo Med. and Surg. Journal*, 1856) suggested a very well-designed plan of drainage.   Having tied the pedicle as a whole, he carried the ends down through an opening made in *Douglas's pouch, thus invert-ing the part like a funnel*, and securing a drain for any purulent matter that might form."   According to Peaslee, *Ovarian Tumours*, p. 438, this was done by Dr. Miner in 1866.   But Dr. Handyside, of Edinburgh, did it in 1846.

Dr. Barnes states among the *accidents after ovariotomy*, that " in two cases *tetanus* proved fatal."   But in the second volume of the *Transac-tions of the American Gynæcological Society*, twelve cases of fatal tetanus are tabulated.

In the eighteenth chapter—*General Observations on Uterine Pathology; Effects of Labour and Lactation; Involution in Defect and Excess*—Dr. Barnes considers the prophylactic treatment of uterine non-involution, thus:—

"By proper care immediately after labour and during child-bed, involution may be effectively promoted.   The first care is to see that the uterus is emptied of placental remains and clots.   The second point is to secure firm contraction by compression and by the administration of ergot, quinine, digitalis, or strychnine. For many years it has been my practice to give these remedies two or three times a day from the very first.   They help not only to lessen the remote dangers of imperfect involution, but also the immediate danger of septicæmic puerperal fever.   The third point is to support the strength of the patient by liberal diet. The fourth is to insist upon *rest* for two or three weeks.   And, lastly, to be satisfied that the uterus is not prolapsed or retroverted.   If retroversion or retro-flexion, a very common condition in child-bed, be allowed to continue, involution will surely be arrested."

The nineteenth chapter is one of the longest in the book, and is upon *Conditions marked by Altered Vascularity or Blood Supply*: it presents no important additions, but still maintains those nice distinctions as fluxion, hyperæmia, congestion and engorgement, which are dwelt on so earnestly by both Courty and Barnes, but which are probably difficult of just appre-ciation and discrimination by the average medical mind.

The most important addition to the twentieth chapter, the subject of that chapter being *Pelvic Inflammation*, is a presentation of the views of Dr. Nœggerath as to latent gonorrhœa.

"In this place reference must be made to the doctrine of latent gonorrhœa, set forth by Dr. Emil Nœggerath.   He submits that gonorrhœa apparently cured, may persist in certain sections of the organs of generation, in the male as in the female, for life, constituting "latent gonorrhœa," that in this form it may infect a healthy person with acute gonorrhœa or gleet; and that in the female it may run from the latent into the apparent form, and give rise to acute, chronic, or recurrent perimetritis or ovaritis.   It is obviously difficult to prove or to disprove how far the doctrine can be substantiated.   I cite it, believing that it has at least an apparent basis in facts; and that the subject is worthy of further investigation."

Perimetric Hæmatocele is discussed in the twenty-first chapter.   This is a subject which has been most diligently studied by Dr. Barnes, both clinically and in the writings of others.

In entire correspondence with the teachings of others he mentions per-foration of the vagina and of the rectum as furnishing exits for the blood tumours.   In a case under our own care more than a year ago where we had diagnosed hæmatocele, the discharge took place through the bladder. Although the time and the place are not now presented for giving the

details of this case, yet there is no antecedent improbability of such way of discharge. Pelvic abscesses may thus find exit for their contents, and take Chassaignac's case of hæmatocele—the blood occupying the vesico-uterine space—other avenue for escape, if escape at all, than through the bladder, could not be found.

The twenty-third chapter is upon *Inversion of the Uterus*. Dr. White's method is given proper consideration, but we regret there is no illustration of his " repositor," which, in our opinion, is the most valuable of all instruments for the reduction of uterine inversion. But we regret still more to find a repetition on page 633 of Dr. Barnes's statement made in the first edition, as to *forcible taxis* :—

" Of late years a proposition has been made, supported by several distinguished American physicians, to admit this method to a recognized place in the treatment of chronic inversion. The fact that death after rupture of the uterus or vagina has several times been the consequence of forcible taxis should alone be sufficient to discredit the method. . . . . Forcible reposition has been attempted either by the hand alone or by aid of a *repoussoir*, that is, some kind of blunt instrument of wood or ivory. Depaul (*Gaz. des Hôp.*, 1851) used a *repoussoir* in a case eleven days after labour. The patient died in a few days from rupture of the uterus. Laceration has also occurred in several cases in America."

In Dr. Weiss's monograph, *Des Reductions de l'Inversion Uterine*, Paris, 1873, two cases of acute inversion of the uterus which Depaul reduced by his *repoussoir* are given ; one patient recovered, and the other (this is the one mentioned by Dr. Barnes) died. And at any rate what have any cases of acute inversion to do with the subject the paragraph started to consider, viz., forcible taxis in chronic inversion ? Moreover, after having described Dr. White's repositor, is it just to define the repositor, even though calling it by a French name, as " some kind of blunt instrument of wood or ivory ?" We fear Dr. Barnes has been misinformed, and we believe he has done unintentional injustice to American physicians ; we sincerely hope, nay we firmly believe, that in the next edition he will materially modify the paragraph we have quoted.

In the chapter upon *Tumours of the Uterus*, the twenty-fourth, the author remarks in regard to Battey's operation : " It is, perhaps, premature to offer an absolutely adverse opinion upon this operation. Peaslee and Emmet, speaking from observation *ad hoc*, as well as with the authority justly due their vast general experience and their steady judgment, accorded it only a qualified sanction." Koeberlé, *Nouveau Dictionnaire de Médecine et de Chirurgie Pratiques*, gives the operation of Dr. Battey more commendation, regarding it as theoretically quite just. He mentions, too, that he himself performed normal unilateral ovariotomy in 1869.

Following this chapter we have one upon *Uterine Polypus*, and then we have four chapters on *Tubercle of the Uterus*, *Cancer of the Uterus*, *Diseases of the Vagina*, and of the Vulva. In the one upon *Vaginal Diseases* the most important additions have been made, and among them are three illustrations of perineo-plasty taken from Thomas's well-known work.

But this review has already been protracted beyond original intention, and it must now terminate.   T. P.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

Art. XXIV.—*Guy's Hospital Reports.* Edited by H. G. Howse, M.S., and Frederick Taylor, M.D. Third Series. Vol. XXIII. 8vo. pp. xx., 402. London: J. & A. Churchill, 1878.

According to our custom we will analyze the Surgical papers and those which interest the physician separately. And first the surgical papers.

Mr. W. A. Bradley opens the volume by a paper on *Astigmatism in its relation to Headache and to Certain Morbid Conditions of the Eye.* We find nothing especially new in the paper, but the iteration of well worn truths is in itself a service especially when dealing with conditions that may exist, and yet be totally unsuspected by the sufferer from them.

The next paper is by C. Higgens, with a title which in its contempt of the article is singularly bad English, *On Tumours of Orbit and neighbouring parts.* Four cases are given as addenda to seven already published in the *British Medical Journal* Dec. 8. 1877. The first case was one of Distension of the right Frontal Sinus. An incision gave exit to a large quantity of opaque yellow tenacious fluid and a cure was effected by forcing a passage into the superior meatus. The 2d and 3d were cases of round celled Sarcoma of the Orbit both of which were progressing when last seen.

The 4th was a very rare form of disease—a Hydatid Tumour of the Orbit. Four years before admission, the left eyeball began to protrude and had grown rapidly for the last three months. The lids could be closed over the ball. A firm somewhat nodular growth was felt between the orbit and the ball at the lower and outer margin. The ophthalmoscope showed a choked disk, followed later by atrophy of the nerve. The diagnosis was a sarcoma. After being under observation for nine months the tumour became fluctuating and was then opened freely when a number of hydatids escaped, and in two months he was well but he did not recover his sight. As Mr. Higgens points out, the diagnosis is in such cases always very obscure but may be assisted by an exploratory puncture. Had an early operation been done the patient's sight might probably have been saved.

Stricture of the Urethra is the familiar title of the next article by Mr. J. Cooper Forster, who is moved "to go back to some old and well-established truths" in reference thereto. First of all he doubts the genetic relation of gonorrhœa to stricture on the grounds that many who have the former do not suffer from the latter, that "a certain proportion of patients, a small one it is true, have had no gonorrhœa" and but few who have stricture, have had prolonged urethral discharge. We suspect but few will agree with him in his doubts, as also in his assertion "that the common seat of stricture is in the bulbous or membranous portion of the urethra," whereas relatively but few strictures are found in the membranous portion. In place of gonorrhœa he invokes "too frequent sexual intercourse as a more potent cause of stricture as the middle or later periods of life are reached" on the ground that "the stricture segment, so to speak, is, as it were, poised between the cavernous tissues in front and the prostatic part behind and in all the changes of position which occur in erection of the organ, extreme or moderate, there is a certain amount of stretching and dragging about this spot."

Surely were this so there ought to be a large instead of a small number of patients who suffer from stricture without any preceding gonorrhœa.

Moreover he is no believer in "strictures of large calibre," for he says "a large number of patients are said to have stricture . . . who have nothing of the kind *or at least* [the italics are ours] in whom a No. 6 or 7 catheter can be easily passed." Has Mr. Forster ever used a bougie à boule ?

He has done external urethrotomy only once in the last seven years "and then regretted it afterwards" and has never performed internal urethrotomy. He relies on the hot bath, opium, and gradual dilatation. The paper will do good by its conservatism in an age of aspiring novelties of treatment, but we are not of the pessimists who see little or naught but evil in to-day and to-morrow and sigh for "the good old times" of our grandfathers.

One of the best surgical papers in the volume is by Mr. W. H. A. Jacobson on *Supra-Condyloid Amputation of the Thigh*. In nothing is the progress of surgery more marked than in its nice distinctions in operative procedures whether as conducive to life, or to the usefulness of resulting stumps, their adaptation to various injuries and diseases, their facility of performance or avoidance of dangers. In this Journal for April, 1868, Dr. J. H. Brinton of this city drew attention carefully to "Amputations at the Knee-Joint and the Knee," and the present paper is practically an additional contribution to the subject. We must be careful to distinguish (1) disarticulation at the knee-joint; (2) Carden's and Gritti's operations which are *trans*-condyloid amputations, and (3) Stokes's modification of Gritti's method, which is a *supra*-condyloid amputation from half an inch to an inch above the condyles. Its chief recommendation is that it may often supersede amputation higher up in the thigh, for it can scarcely replace a knee-joint disarticulation. Its advantages are that it does not open the medullary cavity of the bone, and so diminishes the dangers of osteomyelitis; it retains much of the adductor power lost in higher amputations; the patella being retained and its posterior surface sawn away so that it anchyloses with the sawn end of the femur, the flexor power of the thigh (rectus) is not lost ; and healing takes place quickly, there being no absorption of the cartilage necessary and the flaps being less apt to slough. As in England, so in this country, this modified operation has been too much neglected.

Mr. C. H. Golding-Bird next relates three *Selected Cases*. The first is that of a boy, aged 14, who fell and was brought in insensible but without paralysis or fracture. On the sixth day a fluctuating swelling was discovered at the middle of the lower edge of the left parietal bone. Pressure here produced right lateral spasm excepting the face, and Mr. Bird trephined over this spot. There was an ounce of blood on the bone separating the pericranium from it and a clot between the bone and the dura mater. In seven weeks the boy was discharged well. An excellent illustration of the results of well-timed surgical interference. The second case was one of charbon followed by recovery in which the blood was repeatedly examined microscopically. M. Pasteur's statement that charbon is a disease caused by bacteria in the blood was not confirmed by this case. No bacteria were observed except from a puncture on the surface covered by the poultice. The poultice in at least one case had been on for only an hour, did not smell badly, and had scarcely any discharge. An excellent commentary on the value of the antiseptic dressing. The third case was one of probable hernia of the right ovary. The tumour was first noticed in the morning after a preceding day's hard work. It was at the internal ring, was half an inch long, firm, tender, with impulse on coughing, irreducible and immovable, and the seat of constant pain which was increased at the menstrual period. No definite information could be obtained from a vaginal examination. The tumour was removed about four and a half

months after its appearance, and she made a tedious recovery.   Eventually she suffered quite as much from pain iu the left ovarian region.

Mr. HENRY DAVY, who was dresser to Mr. Howse, presented a paper entitled *Five Cases Illustrative of Antiseptic Surgery and Pyæmia* for the Gurney-Hoare Prize for 1877.   He won the prize (deservedly as it seems to us), and a part of it (yet it covers sixty printed pages) is here presented with remarks by Mr. Howse.   The paper opens with a discussion on pyæmia and then the antiseptic dressings as used by Mr. Howse are described.   These differ from Mr. Lister's in abandoning the mackintosh and substituting for his eight layers of gauze from 10–16 of oiled gauze (1–20) and in addition 10–16 of dry gauze that is from 20 to 32 layers in all !   We can scarcely think this an improvement, and the cost is greatly increased.   The chief end of the oiled gauze seems to be to prevent adhesion to the edges of the wound.   But no mention is made of the use of the '' protective,'' and to us this seems quite as useful in preventing such adhesions as in guarding the wound from the irritant action of the acid.   The eight layers only may be used, adhesions prevented by the protective, and the cost materially lessened by various substitutes for the mackintosh.

The first case reported was one of cancer of the breast.   It eight days it was all healed except the drainage orifice, no noteworthy rise of temperature having occurred.   The second was one of left oblique inguinal omental hernia, which was operated on, the omentum being tied with carbolized catgut and cut away. The temperature only once rose to 100.8°, but the recovery was prolonged owing to a small piece of the omentum sloughing.   The third case was a curious one of painless incomplete fracture of a rickety tibia, which gave rise from the patient's inaccurate history of his case to a doubtful diagnosis of either a rapidly growing tumour of the bone or a localized periostitis.   An exploratory operation revealed the fracture.   He was saved an impending amputation and recovered readily, having had no fever.   The fourth case was one of trephining over the right parietal eminence for incurable epilepsy of traumatic origin.   He recovered, having had a temperature at no time over 99.4°, but with little good result so far as the epilepsy was concerned.   The last case was one of pyæmia attended with a rash which simulated strongly scarlatina, but was possibly pyæmic, the pyæmia itself arising from osteomyelitis.   Each case is followed with excellent though it seems to us (for Guy's Hospital Reports at least) needlessly long discussions.   That following the last case will repay careful reading.

In the volume of the *Reports* for 1876 (see this Journal for January, 1877, p. 186), Mr. R. CLEMENT LUCAS reported a *Case of Fracture of the Skull followed by a collection of Cerebro-spinal Fluid beneath the Scalp.*   The case having since terminated fatally (as was then prognosticated) Mr. Lucas now gives us the *sequel*, fulfilling the witty French idea that ''no case is complete without a postmortem.''   She was readmitted in July, 1876, a year after the accident, with the deep fracture still preceptible, as was also a small remnant of the tumour formed by the cerebro-spinal fluid, though it was scarcely evident except when she cried. In the following May she was admitted a third time, and died after four days of acute meningitis.   The skull was asymmetrical, bulging considerably on the injured side.   The fissure involved the parietal bone, the squamous portion of the temporal and the sphenoid, and was at one place five-eighths of an inch wide.   The temporo-sphenoidal lobe was occupied chiefly by a large dilatation of the lateral ventricle, its walls were reduced to a thin layer of brain substance, and were everywhere adherent to the membranes.   Probably at the time of the accident it was reduced to a pulp, and the most remarkable fact was that the child lived for nearly two years.   W. W. K.

We shall next invite attention to the medical papers in the volume.

In the first of these Dr. FREDERICK TAYLOR reports an interesting case of *Unilateral Atrophy and Spasm*. The patient was said to have been in good health up to her fifth year. At that time, during convalescence from an attack of scarlatina, she had a fit of convulsions which lasted somewhat less than an hour, and was followed by a state of semi-consciousness of three or four days' duration. On recovery the left arm and leg remained paralyzed; they gradually, however, regained power, so that at the end of two months she could move the arm freely and walk without assistance. After some months the limbs contracted, and she had in consequence a permanent limping gait. In course of time she married and had three children, and it was while pregnant with her last-child that the first symptoms of consumption, of which she eventually died, showed themselves. When she first came under Dr. Taylor's care, it was at once seen that the left upper extremity was much smaller than the right, and was kept close to the side. The forearm was flexed upon the arm, and the hand slightly bent on the forearm; she was unable to straighten the limb at either of these joints, though a limited amount of voluntary power over them remained. If forcibly extended by another person the fingers quickly returned to their original position. They were besides subject to constant slow irregular movements. She managed, however, to put the limb to some use, being able to hold, for instance, crotchet work in the left hand while she passed the needle with the right. In the lower limbs the alterations were less marked, the left limb was wasted and there was a slight degree of talipes equinus. Her mind seems to have been unimpaired.

At the post-mortem examination, in addition to the lesions of phthisis, the following changes were found in the brain and spinal cord. The right hemisphere was in all its dimensions smaller than the left. On laying open the ventricles, a striking difference was noticeable in the size of the central ganglia. The outer part of the right corpus striatum was flattened and atrophied, and on section at this point it was found that there was an ill-defined cavity in it, in which a number of vessels lay with filamentous connective tissue around them, but no cerebral substance supporting them. The crura cerebri and the anteror pyramids of the medulla oblongata agreed with the cerebrum in presenting atrophy on the right side, the right pyramid being scarcely more than half the width of the left, but in the case of the cerebellum it was the opposite or left half which was smaller in all its dimensions than the right. The measurements of the pons gave much less certain indications: the difference between the two sides was relatively small, the right being the larger. In the spinal cord the atrophy was on the same side as that of the cerebellum; it was very striking in the cervical enlargement: but no appreciable difference could be detected between the two sides in the dorsal and lumbar regions. The difference in size was upon section found to concern the anterior gray cornu and the antero-lateral column, especially in its anterior half. Under a high power Dr. Taylor could detect no essential difference in any one respect between the elements of the cord on the two sides. The number and size of the ganglion cells were almost identical. There was nowhere any degeneration: and the dorsal and lumbar regions were distinguishable in no respect from those of a healthy cord. Transverse sections of the pons varolii showed in a remarkably striking manner the difference of the vertical bundles in the two sides. Sections from the two sides of the cerebellum were made at the same time, the only difference noted on the atrophied side were these: The granular layer was somewhat less broad, and took a deeper-carmine colour; Purkinje's cells were more faintly stained, but identical with those of the sound side in size, number, nucleation, and structure of processes; the cells of the corpus dentatum were smaller, but not less in number. The minute examination of the other

parts of the encephalon was unsatisfactory; owing to their having been kept in spirit for some time.

Dr. Taylor thinks the conclusion unavoidable, that the disease in the corpus striatum was primary, and that the atrophy of the other parts of the brain as well as of the osseous and muscular structure was secondary. This case therefore supports the view of Lallemand and Schroeder van der Kolk, that the disease is not always congenital, but may arise after birth, and is also comfirmatory of Cotard's opinion, that partial atrophy of the brain is not a primary affection, but the result of inflammatory, traumatic, or other lesions. "As to the exact manner," the author says, "in which the secondary atrophies, whether of the nerve centres or of the limbs, are brought about, the case adds little to what can be gathered from other instances. Schroeder van der Kolk discusses the origin of the deficient growth, and concludes, no doubt correctly, that the shortening and atrophy are caused not only by the inaction of the paralyzed muscles, but also as a direct result of the injury to the nervous system acting through the nutritive system of nerves." He was led to this conclusion by finding that the bones of the fingers and forearm, which are naturally the more mobile, and therefore might be expected to suffer more from inaction, are in these cases the least shortened.

In regard to the more striking features of the case, the atrophy of the cerebellum on the side opposite to that of the cerebrum, the author says that "though well known as a pathological occurrence, this crossed connection of the cerebrum and cerebellum is not generally described in our text-books on anatomy. Meynert, however, not only confirms Stilling's statement that the inferior peduncles undergo a complete decussation beneath the upper pair of the corpora quadrigemina, but also shows that both remaining peduncles cross over to the opposite side in order to connect the cerebellum, in the one case with the vertical bundles of the pons, and in the other with the posterior columns of the cord."

The author devotes a good many pages to the discussion of the physiological questions suggested by the case, which the student of nervous diseases will do well to read. He also appends to his paper the reports and an analysis of nine other similar cases which were observed in the wards of Guy's Hospital.

Under the name of *Chronic Intermittent Albuminuria* Dr. MOXON describes a condition which he says is not uncommon among young men, and which doubtless also occurs in the other sex, although his experience does not enable him to assert this. The urine is in these cases not always albuminous, but is usually so after breakfast. It generally contains a large quantity of oxalate of lime crystals, but apparently never true casts. The symptoms accompanying this condition are very indefinite. The patients are said to be listless, to complain of headache, and to look rather anæmic and gray, and sunken about the eyes. They sleep too much, and rise unrefreshed, and are too ready for rest during waking hours. They are also indisposed to avail themselves of cheerful company. As a rule, they do not regard themselves as sick, being generally brought to the physician by their friends, who regard them as "out of condition." In all the cases which the author has had the opportunity of observing for some time, recovery has taken place. In one or two, indeed, the patient has subsequently undergone a serious illness without any return of the complaint.

In concluding his paper, Dr. Moxon says: "The occurrence of the albuminuria, at a period of life when the sexual system is completing its development, and further, when its aptitudes are not always under normal control, may raise questions of causation of a kind difficult to obtain certain answers to. Starting so near each other, and with so much of close relation in their development, and with common rights of way, so to speak, over not always normally governed passage apparatus, disturbances of the sexual system might be allowed as likely

to reflect disturbances on to the urinary system. The common persistence of nocturnal incontinence of urine in boys until puberty shows how the arrangements for the urine may depend upon sexual completeness." In support of this view, the author refers to the fact pointed out by Rokitansky that there is an association between renal tumours and tumours of the testis.

Dr. TAYLOR is also the author of a paper entitled *A Contribution to the History of Idiopathic or Pernicious Anæmia*, in which he gives the histories of several cases of the diseases which were treated at Guy's, and which have not hitherto been published, and shows conclusively, which indeed every well read physician knows, that Addison was the first to describe it, and that its occasional occurrence was fully recognized by Wilks and the other physicians to the Hospital long before the appearance of Biermer's paper. Dr. Addison gave to the disease the name of Idiopathic Anæmia, which seems to us preferable to that of Progressive Pernicious Anæmia, bestowed upon it by Biermer, inasmuch as remissions sometimes take place in the course of the disease, during which the patient may be restored to a moderate degree of health. This occurred in two cases which were under the writer's care.

In a *Report on Cases of Tetanus Treated in Guy's Hospital*, the same gentleman subjects fifty-one cases of the disease to a critical examination, for the purpose of determining whether or not drugs have any value in its treatment. Only eight cases out of the fifty-one recovered. The remedies administered in these cases being as follows: In 1, Calabar bean; in 1, Calabar bean and chloral; in 1, Calabar bean, chloral, and morphia; in 1, chloral; in 1, chloral and iodide of potassium; in 1, opium; in 1, curara; and in 1, nitrite of amyl. The tables which illustrate the paper show, however (1) that more recoveries occur amongst cases of slight injury than among cases of severe injury; (2) that more recoveries occur amongst the cases in which the tetanic symptoms follow late upon the injury than amongst those in which they come on quickly; (3) that a more slow and chronic type of disease is more frequent amongst cases of mild injury than amongst cases of severe injury. The author is inclined to think that the proportion of cures would have been larger if curara and Calabar bean had been given in larger doses. In the case in which recovery followed the use of the latter drug, it was given in doses of from 1 to 2 grains every three hours for thirteen days, until 125 grains had been taken. On one occasion the patient had seven successive doses of 1 grain each at intervals of fifteen minutes. Curara has been given in Germany hypodermically, in doses of $\frac{1}{3}$ of a grain every fifteen minutes, in cases of hydrophobia, but, in the cases reported in this paper, it was administered in doses only of from $\frac{1}{200}$ to $\frac{1}{100}$ of a grain.

The only contribution from Dr. SAMUEL WILKS to this volume is one entitled *An Account of some Unpublished Papers of the late Dr. Hodgkin*. Most of these were written about the time of their author's retirement from Guy's Hospital, nearly fifty years ago, and are consequently antiquated, while the opinions expressed in them are in some instances obsolete, and the statements superseded by those derived from modern research. We find enough, however, in the extracts which Dr. Wilks has made from them to confirm the high opinion which we have hitherto entertained for the learning and for the powers of observation of their distinguished author, and cannot but regret that his career as a pathologist should have been so brief. His name is usually associated with the disease known now as lymphadenoma; but Dr. Wilks shows also that there is also good reason to believe that he was the first observer of the lesion of the heart producing aortic regurgitation, and it is certain that he so regarded himself. In a paper written more than forty years ago he partly anticipates the discoveries of leucocythæmia. "The whitish corpuscles," he says, "are intimately connected with

the lymphatic system. I have found them particularly conspicuous in a case where the lymphatic glands throughout the body were remarkably large.''

The Treatment of Insanity, more especially by Drugs, is the subject of a paper by Dr. GEORGE H. SAVAGE, in which he urges the necessity of a prompt removal of the patient from his home as soon as decided symptoms of the disease have manifested themselves except in cases of the very young, to whom the associations of an asylum are often demoralizing, of the hysterical or of those in whom the disease evidently depends on some definite physical state that may pass off or be cured in a short time. The author has found the shower-bath useful in some cases of acute mania in young persons who have good appetites and are in fair general health, many of whom are noisy, obscene and destructive, also in the convalescence from acute mental disease. It may frequently be employed in cases of melancholia, but here, he says, special care must be taken that there is sufficient bodily power to insure healthy reaction, otherwise harm may be done. On the other hand it should never be resorted to for patients suffering from general paralysis or from the insanity of decay such as phthisical or senile. In regard to morphia, the author says, it has served him well in cases of active melancholia where sleeplessness alone seems to be the cause of the mental break-down, or where the insanity is the result of chloral taking or of over-stimulation. In ordinary acute mania, general paralysis, profound melancholia, and partial or complete dementia it is of no avail. It is sometimes more efficacious when administered hypodermically, at others when given by the mouth.

Chloral, the author has found most useful in the epileptic status, in the furore of epilepsy, and in some cases of insanity from excess of stimulants (in these cases large doses may be required to produce sleep, and at the same time large doses are rather dangerous). It is also useful in some cases of exhaustion following prolonged restlessness, and in some cases in which the mental symptoms result from other causes that may be relieved by sleep. In some puerperal and some senile cases chloral may be of service in preventing rapid exhaustion. Equal parts of camphor and chloral were given with good results to patients who were destructively maniacal and who were filthy in their habits, and secondly to those who were erotic or lascivious in action ; the combination in these cases often producing quiet, although this quiet was generally but temporary, and preventing the loss of appetite and flesh which often followed the prolonged use of chloral alone. In a few cases, however, the patients to whom it was given became pugnacious, and several who up to the time of its administration were only destructive of property became dangerous to persons.

Dr. Savage's experience has not been very favourable with conium or physostigma, while it has been decidedly unfavourable with hyoscyamine, the active principal of hyoscyamus. In some dull cases, in which the patients are depressed and without energy, a weak, continuous current passed from forehead to nape has, he says, roused the patient and done good, and in one or two cases of acute primary dementia satisfactory results have followed ; one patient distinctly saying that after several months of complete mental blank his first returning sensation was of the current. He thinks that in convalescent cases this treatment may be of service, both from its own effects and from the concentrated attention of attendants and patients. In some cases the author has seen an improvement in the symptoms take place coincidently with the occurrence of some physical disease, and a relapse to occur when this was relieved. He calls our attention to the facts that insanity may be due to constitutional syphilis, and where this is the case it will resist all other than antisyphilitic treatment.

In his *Note on some Cases of Diastolic Bruit*, Dr. JAMES F. GOODHART thus describes a murmur to which he wishes to call especial attention : —

" It is," he says, " usually a blowing bruit, most intense at the apex, but often audible over more or less of the præcordial region even to the base ; it is not audible behind, is diastolic in time, and always follows immediately upon a well-marked, generally loud, systolic apex bruit of regurgitant type, and occasionally so obscures the second sound that it is not appreciable between the two. It is a to-and-fro bruit at the apex similar in rhythm to the to-and-fro bruit at the base in disease of the aortic valves ; and the closeness of this resemblance is shown by the fact that the mitral to-and-fro has several times been considered during life as of aortic origin by experienced auscultators."

This murmur, which is distinct from the presystolic, has been recognized by Marey, Galabin, and Hilton-Fagge, and is thought by these observers to be due to mitral contraction, but in the author's opinion it may sometimes be heard when this is not present.   The following is his explanation of its mechanism :—

" The conditions which are necessary for the production of such a bruit de souffle appear from Marey's experiments above alluded to, to be a septum partially obstructing the auriculo-ventricular opening, and auricular pressure in excess of the ventricular.   These are conditions which quite correspond with those present, where the mitral valve is contracted ; but it is theoretically possible to conceive that with a hypertrophied left ventricle, the auricular pressure might be raised to such a pitch in regurgitation without obstruction, that if dilatation of the ventricle were also associated with it, an auriculo-ventricular opening of normal dimension, or even larger, might, with its flaps and tendinous ends, play the part of a septum with which to generate a bruit.   With reference to an aortic diastolic bruit moreover, it would seem from the experiments of Chauveau that there is no necessity for the presence of any septum for its production.   There is a disproportion between the containing cavity—the aorta and the receiving cavity —the ventricle ; and there is excess of pressure in the former during early diastole : under such conditions a sonorous 'veine fluide' would be generated as the blood passed from the aorta back into the ventricle.   But if this is true with regard to the aortic orifice it is true also, though less generally applicable to the mitral.   The left ventricle is capable of a relative dilatation with regard to the auricular ring and mitral flaps, and under these circumstances, therefore, one might expect an occasional bruit de souffle in the early part of the diastole, when the auricular pressure is high as the result of the regurgitation.   The more dilatation, provided that the ventricle is acting sufficiently well to expel its contents completely, the more likely is the diastolic bruit to occur."

From the *Statistical Analysis of the Patients treated in Guy's Hospital during the Year* 1877, we learn that the total number of patients who have participated in the benefits of the hospital during the year amounted to 79,605, of whom 5544 were under treatment in the wards.   The figures show a lower mortality than has been recorded since 1868.   The deaths during the year amounting to 498, or 9.95 per cent. of the total number.   J. H. H.

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ART. XXV.—*St. Thomas's Hospital Reports*. New Series.   Edited by Dr. PAYNE and Mr. MAC CORMAC.   Vol. VIII.   8vo. pp. xiv., 702.   London: J. & A. Churchill, 1878.

THE previous volumes of this series were issued in paper covers, the present volume comes to us bound in muslin—a change which no doubt will be an agreeable one for many of the subscribers.   Among the contributions to this volume will be found an unusual number of practical interest, among which may be specially mentioned the papers of Drs. Peacock, Ord, and Harley.

We shall notice the medical and surgical papers separately.   First among the

former is a paper by Dr. Thomas B. Peacock, entitled *Statistical Report on Cases of Chorea*, in which he subjects to a critical analysis ninety-two cases of the disease observed by him since the publication of his paper in 1863, in the *British and Foreign Med.-Chir. Review*. Inasmuch as the inferences which the author draws from these cases do not differ materially from those which have been deduced from other similar collection of cases, we shall only refer to a few of the more important of them. Thus a majority of his cases occurred in females, and this difference in the liability of the two sexes to be affected by the disease was noticed as well before as after puberty. In twenty-four cases the patients had had rheumatism, and in two other cases the chorea appeared after the patients had got wet, but the author is evidently of the opinion that the connection which undoubtedly exists between chorea and rheumatism is not to be traced through the heart disease, which is so frequent an accompaniment of the latter. "On the contrary," he says, "in some of the cases in which the attack commenced with rheumatism, the heart's sounds and action were stated to have been quite healthy, and in some of those in which there were decided evidences of heart disease, the patients had never had any rheumatic symptoms either previous to, or during the choreic attack. This seems to indicate that rheumatism rather gives rise to chorea by directly affecting the brain and spinal cord or their membranes, than by causing heart affections, and so secondarily involving the nervous system." Three of the ninety-two cases resulted fatally, the others recovered or improved under treatment.

Mr. William H. Stone's *Remarks on Pleural Tension* seem to have been suggested by the fact that occasionally little or no fluid comes away from the operation of paracentesis thoracis performed only with an ordinary trocar, even in cases where a large amount of effusion is known to exist in the pleural cavity. The paper is doubtless interesting to the student of pneumono-dynamics, but it does not admit of analysis, and we must therefore dismiss it with this brief notice.

The volume contains two papers *On the Treatment of Acute Rheumatism by Salicylate of Soda*. The first of them is contributed by Mr. Seymour John Sharkey, who gives the results of the treatment of this disease by salicin and its derivatives as observed at St. Thomas's Hospital. The drug, it need hardly be said, is found most useful in acute cases, in which the temperature is high and the pain excessive. In these cases a marked subsidence of these symptoms rapidly takes place—sometimes in less than forty-eight hours after the commencement of the treatment. The author admits that its use may occasion delirium in a few cases, and also in consequence of the profuse diaphoresis to which it gives rise, may be accompanied by a general miliary eruption, which very often becomes pustular. Although it has not the power to prevent cardiac complications, it certainly appears to diminish the liability to them. On the other hand, there is no reason, in his opinion, to attribute to it the albuminuria which is occasionally noticed during its use, since albuminuria is now known to be a frequent attendant upon all diseases characterized by high temperature. For instance, out of ten cases in which albumen was present, seven had it before the drug was administered, and it disappeared in all these, while the urine still gave a strong reaction with the perchloride of iron The author has also not been able to verify the assertion, which has been recently made, that it gives rise to glycosuria. He prefers the sodium salicylate to salicylic acid because it is more agreeable to the taste, and is generally better borne. He gives it in doses of 20 grs. repeated every two or three hours.

The author of the second paper is Mr. Ernest H. Jacob, who tabulates one hundred and fifty cases of the disease treated in the wards of the Leeds Infirmary by salicin and its congeners. The effect of the treatment is reported to have been

good in one hundred and three of the cases, moderate in forty-two, and unfavourable in five. In only five of seventy-two cases admitted with healthy hearts did a cardiac complication occur after the medicine was given. In common with Mr. Sharkey, he believes that relapses may occur after this treatment, especially if it be discontinued immediately on convalescence. In the rapidly fatal cases, where delirium and hyperpyrexia are the most prominent symptoms, he has not been able to satisfy himself that it is of the slightest use.

For the sake of convenience we shall next notice an Essay[1] by Theodore Acland, M.A. Oxon, *On Salicylic Acid, with some Observations of the Effect produced by the Drug on the Elimination of Urea.* After narrating the circumstances which led to the discovery of salicylic acid, the author discusses at some length its therapeutical properties and those of salicylate of soda. He shows that while the former possesses antiseptic properties to an eminent degree, the latter is entirely without them. Thus Prof. Thiersch has found that the antiseptic effect of salicylic acid dressings is quite as reliable as that of Lister's carbolic acid. At the same time the salicylic acid has two advantages ; it is less irritating, and it is not volatile. It can also be combined in large quantities with the dressing, and the latter can be left on longer than the carbolic dressing without endangering the result. A further recommendation with many will be the fact that salicylic acid is free from smell.

It does not appear to have any antiseptic properties when administered internally, as for instance in pyæmia, which is probably due to the fact that it unites with the alkalies of the blood to form the salicylates, by which a great part of its efficacy is destroyed. The author points out that this effect may be prevented by giving it in combination with the acid potassium sulphate, or with hydrochloric acid, with a view of giving the salts of the blood something with which to combine, while leaving the acid free.

In the treatment of rheumatism the author has found salicylate of soda much more efficacious than salicylic acid. He believes that it is never in the doses in which it is usually given the cause of albuminuria, which frequently disappears under its use, and which is to be regarded simply as a consequence of the high fever. It diminishes the tendency to cardiac complications if given early, and prevents the extension of these when already set up. It likewise reduces the mortality of the disease. Relapses are, however, very apt to occur, especially if the salicylic treatment is not continued for some days after the temperature has been reduced.

In all these points it will be seen he is in accord with the two observers whose papers have already been noticed. He, moreover, comes to the following conclusions : 1. The diminution in the active processes of fever is followed by diminution in the total quantity of urea excreted. 2. The percentage amount of urea excreted remains (where the diet is regular) but little affected by this drug, or reduction of temperature. 3. The reduction of temperature is consequent on diminution of pain. 4. Salicylic acid acts as an opponent of the causes of rheumatic pain, whatever they may be, and only acts secondarily as an antipyretic. 5. The quantity of the urine is diminished directly or indirectly by the drug.

Experience has shown that it is powerless against variola, and that it cannot compete with quinia as a specific against ague and malarial poisons. It has also been proved not to have a beneficial effect on typhoid fever. In fact the author says he has yet to learn that it produces any other results in this fever than ''delirium to the patient and disappointment to the physician.'' This he attributes to the fact that the elimination of urea is lessened by salicylic acid. '' In rheumatic fever,'' he says, '' the system can tolerate for a short time the non-

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[1] This essay was read before the Physical Society of St. Thomas's Society, and to it was awarded the Society's prize.

elimination of the nitrogenous decomposition products, notably urea, and in enteric fever it cannot. In the one case there is often reduction of temperature and acute delirium. In the other reduction of temperature, and often cure."

One of the most important papers in the volume is *On the Use of the Graduated Bath for the Reduction of High Temperature in Fevers*, and is by Dr. WILLIAM M. ORD, one of the physicians to the Hospital. By the term "graduated bath" is meant a bath in which the temperature of the water at the time of immersion is at some point between 90° and 100° Fahrenheit, and is gradually lowered by from 25° to 30° during an immersion of half an hour's duration. A bath at this temperature, the author contends, is safer than one at 55° or lower, which may often prove dangerous from shock. In common with Politzer (see number of this Journal for October, 1878), he does not attribute all the good effects of the cold bath to its power of reducing the temperature of the body. "It exercises," he says, "in the first instance, a remarkable sedative influence on the nervous system, and in the second place it diminishes the local pain and inflammation." The truth of this opinion is proven by the fact that the excitement, restlessness, and distress so frequently attendant upon fever frequently abate under the influence of the graduated bath long before any considerable reduction of temperature of the body can have taken place. To show that the temperature of the interior of the body is not immediately affected by the cold bath, Dr. Ord performed a number of experiments with a dead body. This was placed, first of all, in a bath at 110°, and then, by means of thermometers placed in different organs or muscles, the temperatures were read off. The water was then gradually cooled to 71°, but, although the body was allowed to remain in the water for three-quarters of an hour, no one of the thermometers indicated a fall in temperature of more than four degrees. The next day the experiment was repeated, and the water allowed to cool until its temperature sank to 50°, when of course a more decided effect was produced, but not so much so as we should have anticipated.

The paper also contains *An Analysis, and Remarks on, Sixty Cases of Enteric Fever treated in St. Thomas's Hospital in the autumn of* 1877 *and the winter of* 1877–1878. In these 60 cases there were eight deaths, or a mortality of 13.33 per cent. In 15 a relapse took place, and in several others a recrudescence of fever. In regard to relapses the author says that they are most apt to occur in cases characterized by constipation during the original attack or during convalescence, and appears inclined to attribute them to the irritation caused by hard masses of feces moving over a long series of fresh raw surfaces. He therefore considers that constipation may be a greater evil than a moderate amount of diarrhœa, and lays it down as a rule that in every case a movement should be obtained at least as often as once in three days. A moderate degree of diarrhœa he recommends us not to interfere with, but if the number of stools exceed three a day some means should be taken to check them ; the author preferring for this purpose morphia suppositories or laudanum injections. Stimulants appear to have been given in very moderate quantities. The highest temperature observed in any of the cases was 106.8°. This was reached two days before death in a case which ended fatally by perforation, and was followed within a few hours by a fall to 97.6°. In this case the temperature was observed to be 103° one hour after death, or 1.4° higher than it was fifteen minutes after death.

In beginning his article *On Simple Meningitis*, Dr. W. S. GREENFIELD calls attention to the fact that many cases which were formerly recorded under the head of simple idiopathic meningitis we should probably now regard as due to tubercular or other disease. There still remains a certain number of cases not arising from local irritation, which we must continue to look upon as simple meningitis.

These, for the sake of convenience, he divides into two classes, one truly primary, the other arising as a complication or sequela of acute disease, or as the result of some blood contamination. The first of these classes is represented by the sporadic cases of cerebro-spinal meningitis occasionally met with in previously healthy adults, and the form which occurs rather more frequently in infancy without known cause. In the second class he places the cases of meningitis which occur in the course of, or as a sequel to, the acute specific fevers, acute pneumonia and rheumatism, acute blood-poisoning, such as pyæmia and septicæmia, or the more chronic blood changes in syphilis and Bright's disease. It is upon the latter class that the author dwells chiefly in this paper.

In regard to the relation of secondary meningitis to the pre-existing disease, the author says that it is a question on which great differences of opinion have existed. He does not think it can always be explained by referring it to the condition of the blood, although this is unquestionably the cause of it in many cases of rheumatism, gout, syphilis, Bright's disease, and pyæmia ; for it often occurs in connection with a primary acute pleuro-pneumonia or other serous inflammation, for which no general blood condition can be invoked as a cause, neither can it be explained by the processes of metastatis or embolism. He thinks it therefore not improbable that the first inflammatory process may give rise to an altered condition of the blood which shall predispose to a similar secondary result. He sees in this extension of disease the illustration of a law which in his opinion governs many secondary morbid processes, and which may perhaps be styled that of homologous reactions. "To state it briefly, there is tendency of morbid reactions, whether inflammatory or other, which start in any particular kind of structure to affect other parts of similar structure in the same way, and also, that homologous organs or parts of organs tend to be affected secondarily to each other when diseased processes arise in them." He exemplifies this law by referring to cases of bone and joint diseases in which bones which are homologous but not symmetrical are affected together. A good example of this is found, he says, in rheumatoid arthritis, and sometimes in acute gout, which often affects the homologous joints of the hand and foot in a definite order which is the same in both. In the cases of bone and joint disease which he had observed, it has often been the upper limb of one side and the the lower of the opposite side which have been affected together. This homology of affection is seen in diseases of parts which correspond in structure or function, and in the fact that when any particular structure or tissue undergoes a morbid reaction, which has any tendency to become diffused or infective, those organs or tissues which are of the same kind are more liable to take on morbid reaction.

We have thus very briefly sketched the main points of this very suggestive and thoughtful paper, which will be found to be well worth a careful study, as will also the reports of cases, eleven in number, with which it concludes.

In some *Further Remarks on Kakke*, Mr. W. ANDERSON gives *An Account of the Pathology and Morbid Anatomy of the Disease*, thus completing the paper which appeared in the last volume of these Reports and which was noticed in the number of this Journal for January, 1878. It will be remembered that he there expressed the opinion that the principal lesion of the disease would be found to be seated in the brain and spinal cord. The autopsy of the case which he reports in this volume does not entirely sustain him in this opinion. The cerebral and spinal membranes were somewhat congested. On the outer surface of the dura mater in the cervical region were two blood extravasations of considerable extent. On microscopical examination of the brain and spinal cord "no changes were found in the nervous structures, but the capillary vessels were unusually distinct, though empty, and were collapsed in a very irregular manner,

as if after great distension.''   On the other hand, the mucous membrane of the stomach and bowels was found to be denuded of its epithelium, recalling the condition which is found in cholera.   Indeed some of the symptoms observed in the case presented a striking resemblance to those of that disease.

The Case of Croup which Dr. W. S. GREENFIELD reports is chiefly interesting from the fact that it occurred in a child ten months old, and that the operation of tracheotomy which was performed for its relief was successful.

On the second day after the operation the nurse incautiously removed the tube. No bad consequences followed immediately upon this ; the wound was nearly closed.   At the end, however, of a week, the child's respiration became difficult, and signs of asphyxia began to show themselves.   In fact after again opening the wound and introducing a dilator, it was necessary to have recourse to artificial respiration before the child revived.   Upon examination of the wound it was found that the first opening had been a valvular one of V shape, and that the tongue thus formed had been pressed backwards into the trachea by the tube. After the removal of the tube there was no dyspnœa until the wound was nearly closed and the swollen subjacent tissues pressed upon the flaps, when the tongue was forced backwards into the trachea.

The tube was removed nine days after the operation, having been left in so long in order to insure complete adhesion of the tracheal flap to the tissues in front.   On its removal the voice was natural and the breathing through the larynx easy.   Nine months after the operation, the child was doing well and presented no symptoms of stricture of the trachea.

In his paper on *Treatment of Hydatid Disease of the Liver*, Dr. J. HARLEY collects and tabulates 96 cases of the disease, which have been reported, since the publication of his first paper in Volume XLIX. of the *Transactions of the Medico-Chirurgical Society*,[1] and finds in their histories additional confirmation of his opinion that the treatment, which he there maintained as the best is that which has furnished the greatest number of favourable results.   It is well known that Dr. Murchison[2] prefers to puncture the hydatid cyst with a fine trocar, and that Dr. Fagge and Mr. Durham[3] have successfully treated the disease by electrolysis, but Dr. Harley says that time has shown that some of the cases reported by these gentlemen were really not cured, but only temporarily relieved, and that this must necessarily be the case with any plan of treatment which does not aim at the discharge of the parent cyst.   Besides which, suppuration, followed by pyæmia, may occur in a cyst which had been treated in the manner recommended by Dr. Murchison.   Dr. Harley, therefore, holds that a permanent opening should be maintained between the cyst and the air by means of a large canula, which should be replaced by a large elastic catheter as soon as it has been loosened by suppuration.   In fact, as soon as possible two catheters should be introduced into the cyst, so that it may be thoroughly washed out by means of them.   As an injection, the author prefers a weak solution of iodine.

Of 31 cases which were treated in this way, 18 radical cures are said to have taken place, and 9 deaths occurred.   In 2 of the other cases the result was doubtful and in the remaining 2 the cysts discharged their contents through the lungs.   As the author admits that some of the "radical cures" are not above criticism, and as 9 cases terminated fatally, we confess that the treatment appears to us to be scarcely justifiable until the means proposed by Dr. Murchison, and

[1] See notice in number of this Journal for July, 1867.
[2] Ibid., for January, 1869.
[3] Ibid., for July, 1872.

by Dr. Fagge and Mr. Durham have failed.[1] The paper is an interesting one, and its value is much increased by the tables which are appended to it.

Mr. J. F. PAYNE, in his article *On the Classification of Medicines, and especially of General Remedies*, alludes to the absolute necessity of some classification, and to the fact that none of those, as yet proposed, are entirely satisfactory. He divides remedies into, 1st. Those acting upon the body itself; and, 2d. Those acting only upon something in or upon the body. The first class is again to be divided into (*a*) General, or (*b*) Organic.

General remedies may be used either for their constitutional or for their local effect. In the first category he places, 1. Nutrients; 2. Tonics; 3. Alteratives. In the second, 1. Superficial stimulants and irritants; 2. Astringents and antiphlogistics; 3. Destructives; 4. Superficial protectives; 5. Emollients and demulcents.

The *Medical Report* for 1876 shows that the total number of patients under treatment in the medical wards of St. Thomas's Hospital, during the year, were 1414, of whom 723 were men, and 691 women. The number of deaths was 256. The report for 1877 shows a slight decrease in the number of patients, the total number being 1371, of whom 747 were women and 624 men. 248 of the cases terminated fatally. These reports derive their chief value from the tables and abstracts of the more important cases which accompany them.   J. H. H.

The first paper which belongs to the surgical portion of this volume is one relating *A Case of Intestinal Obstruction, with Remarks on Tapping the Intestine as a means of Cure in Certain Cases*. By W. W. WAGSTAFFE, Assistant Surgeon to the Hospital. The history of this case, though unfortunately lacking in pathological value from the absence of post-mortem results, is possessed of much clinical interest, owing to the long time over which it extends. About a year after an attack of typhoid fever, a young man twenty-five years old, had stoppage of the bowels with colic, which lasted two days. Similar attacks followed at short intervals, and after the fifth one the sufferer became a patient of Mr. Wagstaffe.

Upon examination a slightly movable, decidedly tender tumour, half the size of a hen's egg, could be made out in the right iliac fossa. Under the use of belladonna and a carefully regulated diet no further severe attacks occurred for five months. On May 19, 1875, however, a hearty meal was followed by vomiting, complete stoppage of the bowels, with bronzed skin, foul tongue, and delirium. On the 24th of May Mr. Wagstaffe saw him, and after resorting to the passage of a tube and the ordinary expedients, on the 26th a fine trocar was inserted between the umbilicus and ensiform cartilage, and much gas evacuated. On the next day it was found necessary to tap him again, and no less than four punctures were made before the necessary amount of wind was removed. Soon afterwards the bowels were freely moved, and despite a slight attack of peritonitis produced by great imprudence, the patient made a good recovery. A year later Mr. Wagstaffe was again sent for, but the attack which threatened succumbed to the use of belladonna. Some months afterwards, during the absence of Mr. Wagstaffe, the patient died, and no post-mortem was obtained, but the supposed cause of the fatal issue was an overdose of belladonna.

Mr. Wagstaffe thinks the case was one of contraction of a typhoid ulcer, with adhesions around the cæcum. Mr. Wagstaffe, from the experience of this case,

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[1] Of the 46 cases treated by simple puncture, reported by Dr. Murchison, only 3 proved fatal. The results of electrolysis are, as far as they go, still more favourable, for recovery took place in all the cases (8) so treated.

and others, one of which he narrated in the last number of the Reports of his Hospital, thinks that there are cases in which tympanitic distension may be a most urgent symptom, and that, whether acute or chronic, tapping with a fine trocar is attended with but little risk, is especially serviceable where the accumulation has taken place rapidly, and is sometimes a really curative measure. He further thinks that the mechanism can be explained as acting by the removal of pressure from above a valvular closure of the gut, rather than by the mere removal of gas from a temporarily paralyzed bowel. Mr. Wagstaffe refers to the paper of Dr. Fagge in *Guy's Hospital Reports*, vol. xiv., and thinks that the operation is worthy of more extensive trial than has hitherto been accorded to it.

The title of the next paper is one which will at once attract the eye of the student of forensic medicine, who will naturally think that *Notes on the Examinations of the Bodies of Fifty Children Born Dead or shortly Dying*, by ROBERT CORY, M.B., Cantab., Assistant Obstetric Physician to the Hospital, must contain a mass of material of very great value. Upon examination, however, we have found the paper disappointing, for while its first part is occupied with the description of certain pathological changes in the livers of syphilitic children, only its latter and smaller part is concerned with certain observations of the comparative weight of different viscera. Such comparisons as medico-legal tests are confessed to be unreliable; and to such a degree is this the case that they must ever be held under very grave suspicion in a court of law. In three cases with a syphilitic history, small white spots were scattered over the upper border of the right lobe of the liver, which upon section were seen to extend throughout the substance of the organ. Upon microscopical examination these spots were found to have an amorphous centre surrounded by small cells, which gradually increased in size as they approached the normal liver tissue. They were confined to the connecting tissue surrounding the portal veins. In two cases in addition to these small gummata, there were evidences of peritonitis present.

The medico-legal points of the paper are the evidence which can be adduced to prove the live birth of children from the position of the umbilicus, the comparative weight of the viscera, and the relation borne to the weight of the body and weight of the liver by lungs in which no respiration had taken place, where partial respiration had occurred, and where complete respiration had been accomplished.

These various points are summarized in separate tables, which are of value in ennabling the medical expert to arrive at a great degree of probability, but do not establish a rule by which he is able, in any given case, to say this case was born alive or that one was born dead. Dr. Cory also found that of nine cases which were dropped from a height of eighteen inches upon a paved floor, in no less than eight were fractures in the course of the lines of ossification sustained. The observations of Dr. Cory have also led him to believe that there is a very constant relation existing between the size of the thymus gland and the development of the osseous centres.

Basing his study upon one hundred and five cases, which occurred in St. Thomas's Hospital within four years, Mr. WILLIAM MAC CORMAC contributes some *Observations on a Series of Dislocations of the Shoulder-joint*. The paper is quite elaborately thought out, but deals rather too much with mechanical details to admit of condensation. Of the entire number of cases, one hundred and four were downwards and forwards, and only one downwards and backwards.

Mr. Mac Cormac thinks that "the more carefully the nature of these dislocations and the method of their production are studied, the more evident it becomes that the most important factor in determining the position of the dislocated bone, and in opposing ill-considered attempts at reduction, is the capsule, and not the

scapular muscles." The case narrated by Sir Astley Cooper, in which one mus-
cle after another was divided in a dead subject before reduction was accomplished,
and where all attempts failed until the supra-spinatus was relaxed, is regarded by
this author as furnishing conclusive proof that it was the unyielding capsule which
was at fault rather than the one dead muscle. However this may be, Mr. Mac-
Cormac thinks that all cases can be reduced by manipulation, and in the steps of
the process is careful to make such a series of motions as will successively relax
the short, strong muscles which have their insertion near the head of the humerus.
Mr. MacCormac is an earnest advocate for the use of manipulation as the mode
of reduction, and very properly discards the use of pulleys, thinking that even in
long-standing cases they can accomplish no more than will follow skilful manipu-
lation. With this view few surgeons will differ, and in America none at all.
When the writer of this notice was young in the profession, pulleys, Jarvis's ad-
juster, and other rude mechanical devices, were still occasionally resorted to by
surgeons; but while their reign was over in America, and they bowed before the
very superior means first methodized by Prof. H. H. Smith, for many years they
continued to dominate over the minds of English surgeons whenever a dislocated
shoulder presented itself. Now, however, the Yankee invention has made its
way to England through the Continent of Europe, and we presume Mr. Mac
Cormac speaks the sentiments of many of his confrères in advising the general
resort to its aid.

In cases of too long standing to make attempts at reduction justifiable Mr. Mac
Cormac following Billroth, recommends resection of the head of the bone wher-
ever from pressure upon the nerve trunks the pain is unbearable. An interesting
case where this plan was adopted is given.

Considerable space is given to a consideration of the very rare accident of a
backward dislocation. Of this one case occurred in the series of hospital cases and
one other is referred to as having been seen by the author in private practice.

As would naturally be expected this paper contains not much that is new, but
presents a valuable study of the subject, and being founded upon the practice of
the house finds a fitting place in a volume of hospital reports.

The next paper is by Mr. EDWARD NETTLESHIP, Ophthalmic Surgeon to the
Hospital, on *Cases in Ophthalmic Practice with Notes and Observations.* The
cases recorded are fourteen of syphilitic choroido-retinitis, ten of detachment of
the retina, and disease of the vitreous, and six cases of abscess in the outlying
lobules of the lachrymal gland, sometimes known as the "Inferior Lachrymal
Gland." It is noticeable that in the second series of cases there was no evidence
of the trouble having been produced by sexual exhaustion as suggested by Mr.
Hutchinson in the *Ophthalmic Hospital Reports*, vol. ix.

A third series of *Anatomical Variations* is contributed by Mr. WAGSTAFFE
and Dr. REID. There were but thirty-one bodies dissected, and a large number
of unusual anatomical features were observed and are recorded in this paper.
Much the larger number were of course found in the muscular system and possess
but little interest out of the dissecting room. We notice one case of variety in
vascular supply both rare and interesting, namely, one in which, in addition to a
normal right bronchial artery, there was one supplied to the lung from the right
internal mammary. In another case there were observed irregularities in the dis-
tribution of the thyroid arteries on one side.

On a possible Source of fallacy in Measurement of the Lower Limbs, by W.
W. WAGSTAFFE, is the title of the next paper. Its author thinks that not nearly
enough attention has been paid to the influence exerted upon measurement by
tilting of the pelvis. It seems to us that this neglect is overstated; for certainly
most teachers of surgery, in this country at least, do give most explicit, and gene-

rally accurate directions, as to the steps that must be taken to secure an exact result. No student who attended the practice of the Pennsylvania Hospital and witnessed the minute and painstaking care which was observed in the measurement of a case of broken thigh would ever be likely to pass the subject by as unimportant. Nor has there been less attention devoted to this matter in kindred institutions in the United States, as is well evidenced by the many articles which have been written and the sometimes acrimonious differences of opinion which have been entertained by practitioners of surgery on this side the sea. Here at least there has been a full appreciation of the importance of the position of the pelvis before a measurement of one of the lower limbs is attempted. To prove his point Mr. Wagstaffe instituted some experimental measurements, which as recorded in his paper show that when the pelvis is tilted upon that side the limb will measure about one inch more than its fellow. The same point is further illustrated by a diagram.

Some of the surgical cases which were included in the *Solly Medal Prize Essay for* 1878, by Mr. C. E. SHEPPARD, form a very interesting paper. This medal and prize was founded in commemoration of the late Samuel Solly, and this paper gives evidence of the good effects produced by the institution of a prize inviting competition. The cases while individually interesting have no connection with each other. They are a *subcutaneous venous angeioma of the thigh* which was successfully removed by incision ; a case of *lymphadenoma* which surrounded the anus, and extended up into the pelvis, which terminated fatally ; a case of *concussion* which died ; one of *compound fracture of the skull*, and one of *separation of lower epiphysis of femur*. As will be seen, at least three of these cases were very rare, and they are recorded in a most admirable manner, but the limits of this notice forbid any attempt at an analysis of them, and we can only commend them to the notice of our readers with the assurance that their interest will well repay for the perusal of the article.

The two remaining surgical articles are the *Surgical Reports* for 1876 and 1877, by CHARLES HENRY NEWBY, Surgical Registrar. 1745 cases were treated in 1876, and 1891 cases in 1877 on 220 surgical beds. The percentage of deaths in 1876 was 7.74, in 1877, 8.56. The Bavarian plaster dressing was largely used in fractures, and carron oil preserved its place in the treatment of burns. It is said that the attempt in 1876 to lower temperature by subcutaneous injections of carbolic acid failed, especially in cases of pyemia. Thomas's splint has been found invaluable in cases of injury or excision of the hip-joint, and Sayre's splint for spinal curvature has been recently adopted with much relief to the patients. Erysipelas prevailed extensively in 1877 despite every precaution, in the two wards which were nearest the infectious diseases wards, and the two wards where it was most commonly present were often overcrowded. One case of farcy occurred in 1876. The contagion was derived from contact with a glandered horse one month before admission. The patient had a scratch upon his hand at the time of his exposure, and succumbed to the disease 37 days after his admission into hospital. The majority of the pyæmic abscesses from which he suffered were superficial in their location.

These surgical Reports are most valuable statistical records, and the elaborate summaries which accompany the tables present a most instructive picture of the surgical practice of this great hospital We can conceive of no better method of keeping hospital records, and it is one which our American institutions would do well to follow. If in the annual reports which are usually presented to their patrons by similar corporations in this country were contained such a summary of diseases and injury in classes, they would prove of much value to the profession, and much less inevitably find their way to the waste basket than they now do.

Appended to the Surgical Registrar's Report is an exceedingly brief table of ophthalmic cases by S. Bernays. These *Statistics of the Eye Department* include the practice of five years, and as they are all contained in one page are too condensed to be of any use, and are not calculated to elevate our ideas of the importance of a department in which during those years 11,479 cases were treated.

As a whole, most of the surgical papers are of value as presenting a history of the actual work done in Saint Thomas's Hospital, although they form the smaller part of this bulky volume. It is noticeable that but a small portion of the surgical staff are contributors.   S. A.

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Art. XXVI.—*The Principles and Practice of Surgery, being a Treatise on Surgical Diseases and Injuries.* By D. Hayes Agnew, M.D., L.L.D., Professor of Surgery in the Medical Department of the University of Pennsylvania. In two volumes. Vol. I. Imp. 8vo. pp. x., 1062. Philadelphia: J. B. Lippincott & Co., 1878.

Since it became known that Professor Agnew of the University of Pennsylvania had in press a work upon Surgery, the profession of the country has been rather impatiently awaiting its appearance, and it is perhaps for this reason that the volume before us, the first part only of the promised work, has been issued at the present time. In a little over a thousand pages the author has treated of surgical diagnosis, inflammation, wounds, injuries of the head and chest, the diseases and injuries of the abdomen, bloodvessels, and osseous system. The limited time at our disposal will only permit of our noticing a few things that have attracted our attention in a rather hurried glance over the work.

The definition of inflammation (''hypernutrition carried on under such an extravagant plenum of supply that the germination and mutation of cell life are generally too hurried to mature, and are therefore unstable and short-lived''), accurate and concise as it may be, will we fancy prove somewhat confusing to many a student, who may have occasion to study the chapter upon this subject. Under the head of treatment, a good word is spoken for poultices, ''applications of great value especially when the object is to favour suppuration, for which purpose nothing else can answer so well.'' Setons, issues, moxas, and the hot iron are pronounced ''heroic remedies that have gone much out of fashion. . . . . Now and then some one fond of lingering about the mausoleums of ancient medicine, and bringing to light their rude weapons of torture, attempts to revive and popularize their use; but I do not think I misrepresent professional sentiment in America by saying, save in exceptional cases of a chronic nature, let them rest in peace.'' Bloodletting is regarded favourably, though, as ''it is a potent remedy,'' it should be used with the greatest judgment; and mercury is placed ''among our most valuable resources. We have no remedy which so modifies or arrests inflammatory phenomena, or which so certainly insures the removal of inflammatory products, as this much-abused agent.''

The origin of pus is declared ''probably twofold; first and principally from the vessels, migrated leucocytes or white blood-corpuscles; and secondly from the stable connective tissue corpuscles, rendered again active by the inflammatory transudation.'' The germ-theory of suppuration is neither definitely accepted nor rejected. In answer to the question, '' Are all the symptoms which follow the opening of a chronic abscess to be referred exclusively to the admission of air and septic matters?'' it is stated, ''I believe that they are not; I find them to follow the use of aspirators as certainly as when other means are resorted to.'' Again,

" some writers, such as Pasteur, believe that in the presence of these organisms consists the essence of decomposition or putrefaction." Again, " while much may be said both for and against this germ-theory, it is certainly true that in almost all cases of decomposition these low or simple organized bodies are recognized in great abundance." But upon the antiseptic treatment, based, as it really is, upon this germ-theory, Professor Agnew speaks more positively:—

" No harm can come of giving the patient the benefit of a doubt in using the antiseptic precautions of Mr. Lister . . . . When such agents are employed as prove destructive to their (the germs') existence the process of healing is greatly promoted. . . . . The antiseptic method of Prof. Lister for the treatment of wounds, I am convinced, after a trial of one year, possesses advantages over all others. While I have not obtained results so extraordinary as those claimed by this eminent surgeon, the success has been so much more satisfactory than that obtained by the ordinary plans, that to decline the use of antiseptic dressing would be, in my judgment, to withhold from a patient the benefit of one of the most important resources of the art. By this plan the suppuration is greatly lessened, the union hastened, the risk of constitutional infection diminished, and the surroundings of the patient rendered less prejudicial to health."

For the arrest of hemorrhage, " the direct or immediate application of a thread to a wounded vessel is" regarded as " on the whole the most satisfactory mode." Styptics are abhorred; torsion is not admitted to possess any superiority over the ligature; to acupressure there are certain objections, very serious ones too. Of the various kinds of ligatures, the carbolized catgut is pronounced " superior to all other forms, ... the only one which I employ, ... has never yet failed in my hands even when applied to vessels the size of the external iliac ;" and the metallic is regarded as " certainly badly adapted to purposes of general ligation."

Of the method of healing of wounds by immediate union it is written, " It requires an imperial faith to believe that the gaping mouths of hundreds of capillaries, whose diameters do not exceed one three-thousandth of an inch, shall so abut that their canals will become continuous, that muscular fibre will meet its fellow, and all the other disjoined parts return to their former connection. To my mind it is simply impossible;" and further on it is declared that " nature follows but one method in the repair of wounds, and that is through cells and intercellular tissue and bloodvessels; in other words, through granulation-tissue, alike present whether the wound be small or great, open or subcutaneous."

In the chapter upon head injuries the author expresses his belief in the harmlessness of sutures used for closing scalp-wounds; attaches little value to Pott's " puffy tumour" as pathognomonic of internal abscess; knows of " no single remedy comparable to calomel in preventing meningitis, and encephalitis ;" advises refraining entirely from operative interference in cases of fracture with depression, and fracture with depression and comminution, when the injury is not also compound; " cannot believe [in gunshot injuries] that the operation of cutting out a circular piece of bone from the skull is in itself serious, so long as the dura mater is not torn, any more so indeed than that of excising a portion of a rib and exposing the pleura costalis ;" thinks it highly proper that pressure should be made upon that portion of a fungus cerebri " which spreads over the scalp beyond the limits of the opening in the bone ;" and strongly urges " gentleness, deliberation, and patience" in making the operation of trephining so as to avoid even scratching the dura mater, a " desideratum of transcendent importance to the success of the operation."

In cases of neck wounds involving the internal or external carotid, it is declared to be " better to tie the primitive trunk; and the same course should be adopted in cases where the bleeding comes from even smaller branches, provided it is per-

sistent, and the vessel cannot be located, or can only be reached by a tedious division of structure.'' In view of the heavy mortality attending ligation of the common carotid, much exceeding that of the external, and the free and readily-established collateral circulation, we cannot but question the propriety of tying the main trunk rather than the vessel injured, or, if it cannot be readily found, the external carotid ; and so far as cases of wound of the internal carotid are concerned the author himself states elsewhere, ''in an open wound of the neck, and where the injury to the internal carotid is unmistakable, the ligature should of preference be applied to the damaged vessel, and upon both sides of the lesion.''

The paragraph on gastrotomy was evidently written some time since, as no account has been taken of the operations made during the last two years or more, including the famous and successful case of Verneuil, in July, 1876. Many will, we doubt not, be disposed to take issue with the author in declaring that, '' No amount of palliation can ever be set over against the subtraction of a single day from the life of a fellow-being.''

In the description of left lumbar colotomy, it is stated that the colon will be found exactly on a line with a point *one inch* posterior to the middle of the crest of the ilium. Allingham says that it is *half* an inch, and his measurement has been generally accepted. Of Simon's rectal exploration, it is said, ''the benefits resulting from such violence are of so doubtful a character, and the evils which have resulted are so serious, that I feel compelled to condemn the practice as rash and revolting.'' We have ourselves seen two deaths consequent upon such exploration. Excision of the rectum is pronounced an operation to be proposed '' on the ground of palliation, not of cure,'' and justifiable only when the disease is epithelial, limited to the walls of the intestine, the peritoneum can be avoided, and the patient is in fair health.

Of the various operations for the radical cure of hernia, ''not one,'' the author thinks, ''can be said to be satisfactory ; and it is a question admitting of grave doubt whether, in the present state of our knowledge on the subject, the surgeon is justifiable in resorting to any other treatment than that by a properly adjusted truss.'' In cases of strangulation, it is advised to employ taxis for '' not more than ten minutes ;'' and it is very happily said that (though its derivative meaning is to put *in* order), '' in the hands of unskilful men the taxis serves to put things very much *out* of order.'' Respecting the operating with or without opening the sac, we find that :

'' In my own experience the Petit method has been so successful, that I never think of dividing the sac, except in cases where its contents cannot be restored, or where, in consequence of the long time that the hernia has been strangulated, there are strong reasons for believing that the parts are not in a condition to be returned into the abdomen. Those who oppose the practice do so on the ground that there must always be some uncertainty in the mind of the surgeon as to the state of the contents when the sac remains unopened. It is possible that an error may be committed on this point ; but I apprehend that for every life lost from this cause, fifty are sacrificed by unnecessarily dividing the sac to inspect the intestine and the omentum.''

At the conclusion of the paragraph on varix, it is stated that :

'' According to my own observations in cases of varix operated on by myself with caustic, and in others which I know had been treated with the ligature, the disease has invariably returned. I do not, therefore, believe that any operation which has yet been devised for the radical cure of varices is entitled to professional confidence.''

Of the various methods of treating aneurism, rest, the ligature, and compression are the only ones regarded with favour, save in exceptional cases. Manipulation '' merits unqualified condemnation ;'' the method of injecting with any of our

present known coagulating agents " should be banished from surgical practice ;" " the experiments of introducing solid substances into the sac have been made on the most hopeless forms of aneurism, but it is doubtful if their repetition will yield any more satisfactory results."

Chapter VIII. is devoted to the ligation of arteries, the directions for the various operations being clear, concise, and accurate, as might be expected from so excellent an anatomist as is the author. The illustrations are numerous, and many among them are familiar friends that have already done good service in the late Dr. John D. Jackson's translation of Farabeuf. Of tying the innominate artery, Prof. Agnew says that, "its claim to be accepted as a surgical procedure falls far short of that for the ligation of the abdominal aorta, and it should meet with the unqualified condemnation of the profession."

Three hundred pages are devoted to the consideration of injuries and diseases of the osseous system; over sixty, however, being taken up with tables of ununited fractures and the fractures treated at the Pennsylvania Hospital from January 1st, 1850, to January 1st, 1874. Valuable as these tables are, and capable of conveying much useful information to one who will carefully study them, we cannot but think that they are somewhat out of place in a work intended, in part at least, for the use of students as a college text-book. We are much pleased to notice that Prof. Agnew enters his protest against the acceptance of the doctrine, taught by some in our country, that shortening ought not to occur after fracture, and if it does occur that the treatment and consequently the surgeon is responsible therefor.

" A bone once broken, however simple the fracture, can rarely be repaired, even under the most skillful treatment, without some appreciable deformity or disability. . . . An examination of the various collections of fracture specimens will convince any one that under the most skillful management some degree of shortening will generally take place, nay, may be confidently expected. . . . I have not met with a single case among all the specimens of fracture of the shaft of the femur, which was entirely free from deformity; and I am equally certain that neither in hospital nor private practice, save in the case of children, have I ever succeeded in curing a case without an appreciable shortening. . . . In all cases of fracture of the femur, except in children, an appreciable degree of shortening may be expected. . . . The long line of distinguished men who have spoken on this subject, with few exceptions, from Hippocrates down utter but one voice, viz., that shortening is the rule. . . . I do not hesitate to say that a fracture in the shaft of the thigh-bone which is cured with one-half or three-quarters of an inch shortening is a good cure, and gives no room for complaint on the part of the patient; and that the surgeon who obtains this result may walk among his professional brethren without being conscious of the least inferiority or want of skill in the management of this class of surgical injury."

The practitioner is strongly urged to make an immediate examination of a fracture and early adjustment.

" To defer an immediate examination is to intensify the subsequent inflammation. In fact every important sign of fracture is rendered less pronounced by delay. The fact that the work of repair in a fracture does not begin until some days after the reception of the injury is no argument whatever for procrastination. . . . No advantage can result from delay, and therefore the sooner the work (of setting the fracture) is done, the better. Delay enhances the difficulties, and involves increased pain and suffering. The parts become swollen and sensitive— conditions which complicate the examination; the muscles offer greater resistance, and the inflammation is intensified by the force required in reduction."

Respecting the use of plaster of Paris, we read:—

" The period which I regard as the only proper one for the use of the plaster roller in the treatment of fractures is after the inflammatory swelling has subsided, and when the surgeon can calculate on the fixed dimensions of the part. If used

earlier than this, the limb will most probably in a few days lie loose in its case, the patient being thus exposed to the risk of an ununited fracture, or, if the swelling is on the increase, the dressing may, in consequence of its unyielding nature, jeopardize the vitality of the extremity by interfering with the circulation."

The Bavarian dressing is referred to in the paragraph on the treatment of fracture of the tibia, but no opinion of its relative value is expressed. In cases of fracture of the shaft of the femur, "the dressing by adhesive plaster, sand-bags, and extending weight, reduces the treatment of most fractures of the thigh to the simplest form, indeed so nearly approaches perfection that little else can be desired, and is equally well adapted to cases in which both thighs are broken." A combination of the inclined plane and extension by adhesive straps is regarded as a plan "preferable to all others" when the fracture is in the upper third.

The patella our author has found to be broken "most frequently by muscular action, when the limb was in a state of greater or less flexion." Hutchinson's view that the separation of the fragments is due to inter-articular effusion is pronounced untenable. Malgaigne's hook is declared an "infernal machine." Very close union is regarded as rather a disadvantage, because of the increased liability to re-fracture.

In cases of acute phlegmonous periostitis it is advised to remove the bone, if it dies, " at as early a period as possible, unless the patient labours under much febrile disturbance of the system, when it is better to delay operative interference until the circulation becomes more quiet." Is it not probable that while one is waiting for this quiet state the patient will become more and more exhausted, and so much the less able to endure any operation? In a case of our own, where, after three months' waiting, we removed the entire tibia from epiphysis to epiphysis, we will always believe that we waited at least one, if not two, months too long, in the vain hope that the constitutional disturbances would quiet down. In the concluding part of the article on necrosis, notice is made of the dental engine, pronounced "not only admirably suited for many operations on the bones, but the applications of which are almost unlimited."

In hurriedly looking through the book, as we have unfortunately been compelled to do, a few typographical errors have been noticed, e. g., urethra for ureter in the sentence, " pain shooting down from the loins to the testicle, as in renal colic, indicates the presence of a stone in the urethra." One hundred instead of three hundred in the statement of the period before Christ when Erasistratus flourished ; antiplastic, instead of anaplastic or autoplastic ; 1520 the date assigned to Ambrose Paré must be a misprint, perhaps for 1580 or 1582, as this " representative man of that period" was born in 1517. The work is profusely illustrated, and well illustrated too, though a good many of the 897 engravings are old acquaintances. In conclusion, it only remains to say that our medical literature has much reason to be proud of this late addition to it, made by one learned and experienced ; and we hope that we will not have to wait long for the appearance of the second volume, written as it will be *from* practice, not *for* practice.

<div align="right">P. S. C.</div>

ART. XXVII. — *Stricture of the Male Urethra, its Radical Cure.* By FESSENDEN N. OTIS, M.D., Professor of Genito-Urinary Diseases in the College of Physicians and Surgeons, New York, etc. etc. 8vo. pp. vii., 352. New York : G. P. Putnam's Sons, 1878.

THE author of the volume before us has distinguished himself among his fellows by his able discussion of genito-urinary questions. He is the master of a lucid

and often vigorous style. He possesses in an admirable degree the art of setting forth the truth in an original and striking form. His ingenuity has given to the profession a number of exceedingly valuable urethral instruments. With all this in his favour, and with the prestige of a deserved reputation, his latest contribution to the literature of his subject seems to us to be of limited worth.

The volume should be entitled: Dr. Otis's method of treating what he calls stricture; for in no sense can it be called a treatise upon the disease itself. It is made up largely of papers which have heretofore been made public; articles published originally in the *New York Medical Journal*, in 1870, 1872, 1873, and 1874; reports made to the New York State Medical Society; an Essay which first appeared in Dr. Seguin's valuable series of *American Clinical Lectures;* and a few minor reprints from the London *Lancet.* Observing a chronological order in the reproduction of these papers, the reader will find that no other order or system has been observed. He will look here in vain for chapters devoted in course to the symptoms, etiology, pathology, diagnosis, and treatment of the disease. As a consequence there is an iteration and reiteration of facts and arguments, and an over-sprinkling of many pages with italic and capital letters, which produce a general declamatory effect. Nor is this all. Frequent traversing of the same ground has involved an unnecessary reproduction of the same illustrations. Thus, for example, we find the same cut of the author's improved bulbous sound on pages 23, 53, and 136; of his small dilating urethrotome on pages 51 and 103; of his urethra-meter on pages 90, 136, and 77; and of the familiarly-old Henle-Cruveilhier section through the glans and fossa, on pages 76, 137, 161, and 177. The perusal of the work is thus rendered needlessly futile and tedious. It is like hearing an opera with the overture reported in every act and the tenor singing all of the parts.

Never more than to-day was the demand so imperative upon the book-maker for system, conciseness, and perspicuity. He is called on to prepare for his task with self-castigation, and to cultivate an Herodian pitilessness for the children of his brain.

Stripped of their five "retrospects" and of the "itinerary . . . with my family," the peculiar views of the author set forth in the book may be briefly summarized as follows: (*a*) The urinary meatus is not a trustworthy guide to the determination of the normal calibre of the urethra; (*b*) the urethra-meter of the author supplies such a guide to the normal urethral calibre; (*c*) all urethral resistances, to the passage of a bulbous sound whose dimensions correspond to the calibre as thus determined, constitute "strictures;" (*d*) all such "strictures" occasion gleet; and (*e*) the radical treatment of these conditions is the complete division of these resisting portions of the urethra, however numerous they may be.

But the normal male urethra, when undistended, is a long closed valve with walls in perfect apposition. Its so-called "calibre" is a mechanically produced space, varying in size, within certain limits, according as it is distended with urine or semen, and according to the degree of the *vis-à-tergo.* This latter varies with different individuals, and with the same individual at different periods of his life, and at different hours of the day. Surrounded as it is by muscular and elastic fibres, and lined with a sensitive membrane, the extent of distensibility of the urethra must ever be dependent upon conditions. No subjective symptoms can, therefore, accurately register the point where normal distension has been attained. Any procedure based upon the necessity of completely sundering every portion of the urethra where complete distension cannot be obtained, must occasionally prove disastrous.

Resting upon the propositions described above, we find certain doctrines more or less prominently supported, either by implication or formal statement, which

it is difficult to accept without reserve. Of these may be mentioned: (*a*) That a stricture originating in a damaged urethral patch, occupying at the outset only a portion of the circumference of the canal, results eventually and inevitably in a circular or annular coarctation involving the entire circumference; (*b*) that such damaged patches, limited at the outset in contour and depth, even though thus limited, invariably interfere with the current of urine to such an extent as to produce local irritation and thus extension of the pathological process; (*c*) that all strictures give rise to gleet, and that all gleets originate in stricture; (*d*) that gleet, even though it arise from the simpler forms of stricture, cannot be cured without dividing such stricture; (*e*) that internal urethrotomy is attended with so small a percentage of serious results, it is proper to resort to it even in the treatment of strictures of the greatest permeability and widest distensibility.

The arguments adverse to these propositions are presented with a great deal of candor, and are answered sometimes effectively, occasionally with an apparently unconscious evasion, often with a *petitio principii.*

Conservative surgery may well demand recognition in the treatment of genito-urinary diseases. Already, here and there in our journals, may be seen the protests of conservative writers against the unnecessary mutilations that are too commonly practised—meatotomy, for example, merely an an aid to diagnosis. On the 41st and following pages of the volume before us, we find the record of a gentleman who, seeking relief for a urethral discharge, first had his meatus divided and subsequently was subjected to three different incisions of the urethra. After all this, notwithstanding the fact that there was an "entire absence of the purulent discharge," the patient being able to attend to all his ordinary duties, and complaining of no symptom of which there is record, he endured four additional urethral incisions, apparently for no other reason than that the urethrameter revealed as many resisting surfaces.

The tables incorporated with the text are full and instructive; and will prove valuable for purposes of reference. Their value would have been greatly enhanced had a synoptical summary been added to each. We are much pleased to note that the author gauges all instruments by the French scale, which is founded on the metric system. The gradual adoption of this system by professional men in this country has been greatly accelerated during the last year by the united action of several associations, journals, and able writers, and it is encouraging to believe that it offers a means of securing uniformity also in the manufacture and mensuration of urethral sounds. The perforated scale-plates figured upon the frontispiece are, however, far inferior to the ingenious hand-made plate (devised by Handerson, of New York) whose long triangular aperture will register the size of any instrument for any scale desired—a method in practical use among the wire and pencil-lead makers.

Viewing the volume as a whole, we must conclude—and reluctantly in view of the author's brilliant reputation—that this is a book which includes much transient matter between its covers—a book that will scarcely stand the test of time. A great critic is ten years. It cannot be doubted that a conscientiously-wrought, systematic treatise upon the same subject from the same pen, would have achieved a gratifying success. As the matter stands, it yet remains for an American author in the future, to gather up all that is really good in these pages, and to incorporate it, after giving due credit to Dr. Otis, in some treatise with a larger scope and greater longevity prospects.

The literary blemishes and typographical errors that we note are too few to require comment. The cuts are creditably finished, and the well-known publishers have executed their task in really elegant form.   J. N. H.

Art. XXVIII.—*The Identification of the Human Skeleton. A Medico-Legal Study, to which was awarded the Prize of the Massachusetts Medical Society for* 1878. By Thomas Dwight, M.D., of Boston, late Professor of Anatomy at the Medical School of Maine.   8vo. pp. 54.   Boston: David Clapp & Son, Printers, 1878.

This timely contribution to the literature of legal medicine bears evidence of considerable research on the part of the author.   It deals with a subject which, although of no special interest to the general practitioner of medicine, may at times assume a considerable importance, as when, in a trial for murder, it becomes necessary to produce the body of the alleged victim as the *corpus delicti*, and its identification must be established solely by the skeleton, or fragments thereof. From the time of Orfila the medical expert has been in possession of certain data or rules, given by different authorities to guide him in the identification of the dead from the inspection of the bones exclusively—for example, to determine the age, sex, stature, and sometimes even the probable cause of the violent death, as when marks are exhibited of a recent fracture of the skull; but all have been forced to acknowledge the inadequacy of these "rules."

As the author informs us that his "researches apply solely to the skeleton, and to that of the adult Caucasian," all references to articles of clothing or ornaments, and to all marks upon the skin, congenital or acquired—such as moles, nævi, cicatrices, tattoo-marks, etc., are excluded, and the observations are narrowed down to the inspection of the bones exclusively.   But even with this limitation, one may occasionally glean important information as to the identity of the body by the discovery of some remembered deformity or peculiarity, such as curvature of the spine, club-foot, anchylosis, fracture, etc.

Several important points are discussed.   First, Are the bones human ?   Of course, no difficulty can be presented under this head, provided the entire skeleton be discovered; but the case is widely different if only a few fragments are submitted for examination; and in such a case no person but one skilled in comparative anatomy should presume to give an opinion.   Some ludicrous blunders on this subject are recorded in the books, where the bones of the lower animals as the ox, horse, dog and sheep have been mistaken for human bones, even by professional men.   In such an investigation, a microscopic examination of the bony fragment might afford important aid, since it has been shown that the bone-cells differ in size in the four great classes of animals.   They are smallest in birds, largest in reptiles, and intermediate in mammalia.   In fishes they differ entirely in appearance from the others.   As regards the identification of the *skull*, we may suppose that the only question that could possibly arise would be to distinguish between the human cranium and that of one of the higher apes.   Here it may assist the inquirer to recall the fact that the latter, in common with the crania of most of the lower animals, contains two additional bones (not found in man) between the upper maxilla, termed intra-maxillaria, or incisoria; and that, although the sutures between these and the contiguous bones may become somewhat effaced by age, they are never completely obliterated.   The question whether the simple inspection of the skull will enable us to determine the *race* to which the individual belonged, cannot, we think, be answered with sufficient accuracy to make it of much practical value in a medico-legal case.   Of course, it is easy to distinguish between typical crania of the different races—for example, between the Caucasian and Negro; but then, as every one knows, even these often shade off so insensibly in their individual points, as to render it impossible to arrive at a definite conclusion from any single specimen.

The question, Do the discovered bones belong to one individual? cannot always be answered satisfactorily, since the mere finding them together does not afford positive proof, because it is possible that they might have been so placed purposely for deception; but here the knowledge of the anatomist will usually enable him to detect the attempted fraud.

The fact that the bones of the two sides of the body differ in their length is of more frequent occurrence than is generally supposed, and deserves consideration in this connection. The author quotes from 102 measurements tabulated by Dr. J. S. Wight, of Brooklyn, in which the legs were unequal in 79 cases, and equal in only 23 cases—the left leg being usually the longer. The inequality in 26 cases amounted to half an inch, or more. This fact may be of some practical importance in determining the amount of shortening after fracture of the femur. Dr. Dwight has himself ascertained that the two *clavicles* often differ in length. Thus, in 22 cases, he found only six pairs equal: "the remaining sixteen showed a difference of .39 inch; and four others a difference of over .19 inch. In only two cases was the right clavicle the longer."

As regards a difference in the length of the *arms*, the author records the results of the examination of twelve skeletons as follows: in five cases the humeri were equal; in three, the left humerus was the longer; and in four, the right was the longer—the greatest difference being half an inch. The right radius was the longer four times, the difference never exceeding one-eighth of an inch. The two radii were equal in eight cases. In eleven skeletons he found the left femur the longer in four, and the right in two cases, the difference in one instance being .75 inch. Of the tibia, the right one was the longer four times, and the left six times. It is curious to notice that sometimes the longer femur and tibia are found on opposite sides.

To determine the question whether certain given *vertebræ* belong to the same skeleton is not usually attended with much difficulty, provided all the pieces are present, so as to be arranged *in situ.* But if several vertebræ are absent, the difficulty is much increased. To aid us in such cases, the author has prepared tables of the ascertained weights of the individual vertebra, by the use of which we may determine the question, at least approximately. Tables are likewise given of the heights of the bodies of the different vertebræ, together with the spread of their transverse processes—the variations in both cases being expressed by curved lines, as well as by figures. The author also lays proper stress on the anatomical marks by which the different vertebræ can be identified, especially the seventh cervical, the three lower dorsal, and the first and fifth lumbar, all of which possess certain recognized individual peculiarities.

It is not always possible to determine whether the *ribs* belong to a given spine; although it is generally easy to say whether these ribs belong together, by arranging them in their proper order, and noticing the regularity of their increase in length down to the seventh or eighth, and the steady recedence of the angle from the tubercle, as we go down.

As regards the *hand*, the author's observations confirm those of preceding authorities, in showing that, in the great majority of cases, the ring finger is longer than the index. The possibility of identifying the individual phalanges is also asserted, several characteristic marks being given, by which some of them, at least, can be recognized. In estimating the whole length of the hand from the bones, we should not forget to add about five-eighths of an inch for the soft parts intervening between the different joints. The possibility of determining the length of the hand from a single phalanx (the first of the middle finger) has been asserted by M. de St. Luca (*Cosmos*, Oct. 2, 1863, quoted by Dr. Taylor), who states that this phalanx is equal to one-fourth the whole length of the hand,

including the carpus ; and further, since the hand measures one-fifth the length of the arm, and the length of the two arms added to that of the two clavicles, together with the breadth of the sternum, is equal to the whole height of the body, we may determine the stature of the skeleton by simply measuring the first phalanx of the middle finger. We must believe this statement of M. de St. Luca to be only approximately correct, inasmuch as the length of the hands, and especially that of the fingers, varies so materially in different persons of the same height. In making such an estimate, it will be found that so trifling a variation in the length of the first middle phalanx as the one-sixteenth of an inch would, according to this method of calculation, make as great a difference in the total result as two and a half inches.

In estimating the true length of the *foot* from the bones, the author's recommendation to add one and five-eighth inches for the loss of the soft parts, is experimentally correct.

The question of *sex* can usually be determined from the entire skeleton without difficulty by the inspection of the pelvis, to which the author very properly assigns the first importance as a means of distinction. We need not here advert to the well-known points of difference between the male and female pelvis, as they are so minutely described by the anatomist and obstetrician. Other points in this comparison to be noticed, although of inferior importance, are the differences in the skull, thorax, sternum, clavicle, femur and sacrum. We may observe, in passing, that the author ascribes little importance to the shape and size of the thyroid foramina as a means of diagnosis. Dr. John Neill, of this city, has given us the results of thirty-two examinations made by him to determine this point, which go to show that the foramen in the male is oval, while in the female it is triangular ; also, that it is largest in the male. (*Trans. of Coll. of Phys. Phila.*, vol. iii., No. 2.)

The question of *age* is more difficult to decide from the skeleton than that of sex. Indeed, in the majority of cases, on account of individual variations, we cannot expect to arrive at a positive conclusion on this point. The teeth, of course, in the order of their appearance (which is tolerably uniform) will afford material aid up to adult age. Apart from the teeth, regard must be had chiefly to the union of the various epiphyses, the obliteration of the cranial sutures, the joining together of distinct pieces of bones—such as the sternum and coccyx, the absorption of the alveolar processes of the lower jaw, and the widening of its angle. Thus, "if the epiphyses of all the long bones are firmly united, it is safe to consider the age to have been at least twenty-four in the male, and twenty-two in the female ; whilst, if the union is imperfect, the presumption would be that the age was not over twenty, almost certainly not in the female." If the bones of the sternum and of the os coccygis are perfectly united, it would be safe to infer, according to good anatomical authorities, that the age is from fifty to sixty years. It is scarcely necessary to remark that very old bones become lighter and more brittle, and the flat bones considerably thinner, from the absorption of the diploë.

As regards the skeleton of a new-born child, probably the most reliable criterion of its age is afforded by the degree of ossification of the lower cartilaginous epiphysis of the femur, as first pointed out by Beclard. If the osseous deposit be wanting altogether, the age has not advanced beyond the eighth month of fœtal life ; while, if the bony islet measures two or three lines, we may be certain that the child has attained to full term.

As to the question of *stature*, we quite agree with the author that the so-termed "rules of proportion" of the human body are not reliable guides. The safer plan, if the skeleton is entire, is to arrange the bones *in situ*, and then measure

the height, making proper allowances for the soft parts. But even here, absolute accuracy cannot be attained, chiefly on account of the variations in the curve of the spinal column in different individuals. As the result of numerous measurements, both his own and others', the author assumes the total height of the intervertebral cartilages to be 25.6 per cent. of the entire length of the spine. In order to obtain as correct a measurement of the spine as possible, the author describes the method of Prof. Meyer, of Zurich, which seems worthy of general acceptance, although somewhat complicated; so likewise, as to the proper method of placing the spine upon the pelvis, Meyer's rule is "to bring the anterior superior spines of the ilia and the spines of the pubes into the same vertical plane;" this the author slightly modifies by "bringing the iliac spines even a little further forward."

As a collateral aid in estimating the stature, we may also have regard to the generally accepted rule that the top of the symphysis of the pubes is about the centre of the body; although, from a considerable number of measurements made by Quain, Sappey, Quetelet, Gould, and others, the conclusion is that in average men the centre is a little below the symphysis, whilst in average women it is at the symphysis.

If certain parts of the skeleton should be missing, the deficiency must be supplied from the average size of the lost part. In the case of the head, the deficiency (from numerous estimates) is "practically for the male, five and a half inches, and for the female, a trifle under five, together with the height of the front of the arch of the atlas, and an additional quarter of an inch for the scalp." Another valuable rule in case of loss of the head is that of Dr. Gould: "to find the height of the spine of the seventh cervical vertebra from the ground, and add to this 9.95 inches, which is the average height from this point to the top of the head." In case of loss of the pelvis and lower limbs, no very definite rule can be given.

In a trial for murder it may sometimes be important to determine the time that has elapsed since the death of the victim. Unfortunately, this question can hardly ever be satisfactorily answered by the expert, since so many circumstances have to be considered, such as the prevailing temperature, the degree of exposure of the body, the nature of the soil in which it was buried, the dryness or humidity of the atmosphere, etc., all of which materially influence the result, and ought to produce a becoming reserve on the part of the witness.

From the above somewhat extended examination of Dr. Dwight's brochure, we feel very favourably impressed with the results of his investigations, which have evidently been carefully and conscientiously conducted; and we welcome his book as a valuable addition to our stock of medico-legal knowledge.

<div align="right">J. J. R.</div>

Art. XXIX.—*Clinical Lectures on Stricture of the Urethra, and other Disorders of the Urinary Organs.* By Reginald Harrison, F.R.C.S., Surgeon to the Liverpool Royal Infirmary, formerly Lecturer on Surgery at the School of Medicine, and Surgeon to the Liverpool Northern Hospital. 8vo. pp. xi., 193. London: J. & A. Churchill, 1878.

The name of Mr. Harrison was made familiar to some American readers about ten years ago as one of the editors of the *Liverpool Medical and Surgical Reports*, which, though more deserving than some of its competitors among the

army of annuals which then sprang into existence, was perhaps as short-lived as any of the number.

In this modest volume of Lectures, Mr. Harrison again appears in the world of letters, and by the simplicity of his style, the practical good sense displayed, and the value necessarily attached to decisions based, as they are, upon a large experience, is entitled to a respectful hearing, and, in our opinion, to the confidence of all who may consult his pages for information.

The man who, in this period of the world's history, essays to write upon so important and thoroughly investigated a subject as disorders of the genito-urinary apparatus, cannot expect to bring forward many things which will be essentially new, but must content himself, in large measure, with pronouncing upon the suggestions of others. During the last twenty years we have passed through an era of discovery and advance, and in the attempt to aid the cause of progress, many suggestions, good, bad, and indifferent, have been made. We now seem to have reached a position in which good service can be done for the cause of surgical science by pausing, and submitting to a critical analysis the practical value of the many suggestions made, and by testing, in the light of experience, the right which some modern methods have to continued existence.

It is from this standpoint that the work of Mr. Harrison is seen to be important, and it is eminently fitting that one whose opportunities, as surgeon to an infirmary in the greatest seaport of the globe, have enabled him to apply these crucial tests, should pronounce his opinion as to the value of the methods he has tested, and his judgment must be considered as carrying much weight.

Mr. Harrison restricts the term stricture to those cases in which organic narrowing of the canal exists, regarding those in which the stoppage is produced either by "spasm" or inflammation as too transitory in their character to take their place with them. In thus restricting his definition he is in accord with one whom all must look upon as a leader in this branch of surgery, namely, Sir Henry Thompson.

Mr. Harrison thinks that it is a mistake to say that a stricture has been produced by a gleet, as is so commonly done, inasmuch as he maintains that a gleet is indicative of a stricture already existing in its first stage. In this position he will have the endorsement of many careful surgeons, who have been taught by experience that among the best methods of treating a gleet is to introduce a full-sized bougie, and who have found in so doing that there is almost always an appreciable amount of constriction present. In this connection the causative influence of injections is discussed, and it is well shown that the balsams act locally as well as do injections, and that to neither can a stricture be justly ascribed unless their action has been so active as to constitute them irritants of the urethra. Mr. Harrison is much opposed to large injections for the treatment of gonorrhœa, favouring the frequent repetition of small ones, and holds that, if not too potent, no harm can follow their use.

The classification of strictures adopted by our author is—

"First. Free (inside the canal), including warts, valves, and bridles.
"Second. In the walls, including traumatic and ulcer cicatrices.
"Third. Outside and around the mucous membrane, including peri-urethral callus, as ring stricture (short), nodular stricture, diffuse stricture."

Passing over the second lecture, which is occupied with the very important anatomical details, without an accurate knowledge of which no one should venture to concern himself with the surgery of the urethra, in lecture third we come to the symptoms of stricture, which are divided into those which are indicative of the inflammatory stage, and those which are derived from the obstruction of the lumen of the urethra. Mr. Harrison strenuously maintains the orthodox position

that a stricture does not tend to recovery, and in this lecture he details briefly, but clearly, the progressive changes which the gradual contraction of the stricture produces upon the whole genito-urinary tract.

One case is related which occurred under Mr. Harrison's notice, in which the bladder was ruptured by the effort to overcome the obstruction presented by a stricture, and fatal effusion of urine into the peritoneal cavity followed. Attention is also called to the severity of the symptoms which sometimes follow operations upon the urethra, and one or two instances are given in which death resulted from the introduction of a catheter.

The fourth lecture is devoted to treatment. Mr. Harrison lays great and deserved stress upon the importance of gentleness in the use of the catheter, and recommends that it should be introduced when the patient is lying down. Mr. Harrison himself prefers the short-curved instruments of Syme, but thinks it wise for the practitioner to confine himself to one form of instrument, as, like the man of one book, he will best become dexterous in the introduction of instruments into the bladder if they always have the same form. He does not like bulbous-headed sounds for exploring the urethra, but prefers them for the dilatation of a stricture. The neck of such sounds should be very flexible, so as to be self-guiding. Following the example of the late Mr. Wormald, of St. Bartholomew's Hospital, castor oil is recommended for the lubrication of bougies as preferable to olive oil. The dilatation should be very gradual, four or five days intervening between the sittings; but the dilatation should be carried to an extreme by the passage of an instrument somewhat larger in size than the urethra when undistended. The method of continuous dilatation, by allowing a bougie to remain in the canal for from forty-eight to seventy-two hours, is endorsed as possessing much merit, and as especially valuable in those cases where there is much intolerance of catheterism. While the bougie is thus allowed to remain, it is of great importance that the temperature should be carefully watched, and should a sudden rise of the mercury take place, the bougie should be immediately withdrawn from the urethra.

In his fifth lecture, Mr. Harrison treats of the accidents which may occur during the treatment of a stricture, namely, Urethral Fever, Suppression of Urine, Hemorrhage from the Urethra, and False Passages; while Retention of Urine, Catheterism, Impassable Stricture, Aspiration of the Bladder, Tapping, Cock's Operation, and Forcible Catheterism are discussed in the sixth lecture. Aspiration receives a hearty endorsement from our author wherever the bladder cannot be reached in the natural way, as not only affording the desired relief, but as making the after-treatment of the stricture much easier. Where the destruction of the urethra is so complete as to afford but little hope of its ultimate restoration, Mr. Harrison has had very good results from the operation of tapping the urethra at the apex of the prostate gland, as devised by Mr. Cock. The attempt to force a stricture is emphatically condemned as unscientific, and well adapted to do much injury; at the same time he condemns the practice of converting Cock's operation into a perineal section, advising that the direct division of the stricture be left until a later date.

The seventh lecture is very interesting. It treats of external section of strictures, and discusses the various operations which have been devised and practised with this end in view. The peculiar operation invented by Mr. Wheelhouse, of Leeds, is much praised, and the paper of that gentleman in the *British Medical Journal* of June 24, 1876, is quoted *in extenso*. This method consists in making an opening into the urethra a quarter of an inch in front of the stricture. The edges of the divided canal are then held apart, by appropriate forceps, and a hook on the end of the director upon which the incision has been made. The

operator is then enabled to look at the seat of stricture, and can try to insert a fine probe through it, and, when this is once accomplished, the constriction can be accurately divided in the line of the canal. Mr. Harrison has had some success with this ingenious method.

The eighth lecture treats of strictures complicated with, or caused by syphilis; while the ninth is devoted to a discussion of some of the consequences of strictures. In his tenth lecture, which is occupied with rupture of the urethra, Mr. Harrison says that perineal section is the safest course to adopt, for the following reasons:—

"1. Because of the impossibility of accurately determining the extent and direction of the laceration.

"2. Because incision is the surest means of preventing extravasation of urine.

"3. Because incision diminishes the risk of a stricture forming; or, at all events, moderates the severity of such a formation."

Internal urethrotomy is treated of in the eleventh lecture. This operation, Mr. Harrison holds, should be restricted to those cases which experience has proved, by direct and patient trial, do not bear dilatation well. He does not approve of Dr. Otis's proposition to make it a standard operation for all cases, even in the early stages of the formation of a stricture. This disapproval is fortified by the results of the treatment in the hands of Mr. Berkeley Hill and himself. The advice will be looked upon as sound by all those who do not make use of a cutting operation so long as it can be avoided. In those cases where an internal division of the stricture is rendered necessary by its persistent tendency to contract when simply dilated by bougies, Mr. Harrison uses an instrument of his own devising, by which two limited incisions are made at the same time in the roof and in the floor of the urethra. After using this instrument, which is pictured in his book, he employs oval-shaped bougies, the effect of which is to dilate the stricture laterally, and thus separate the lips of the incisions. Mr. Harrison has employed the immediate method of Mr. Holt in about seventy cases with very good average results. He thinks it is peculiarly suited for those cases in which it is apparent that the stricture is entirely submucous—in those cases where the stricture is short, and in those in which several strictures exist with false passages—and he is not prepared to admit that it should be entirely superseded by internal urethrotomy, although such improvements have lately been made in this latter method.

We have now followed our author through the eleven lectures which treat more directly of the urethra. The remaining seven comprised in the volume are occupied with Foreign Bodies in the Bladder—Hypertrophy of the Prostate—Cystitis—Calculous Disorders and their Treatment—Tumors and Diseases of the Bladder. So much space has already been consumed that we are compelled to pass them by with the bare mention. Whoever consults the volume itself will find that these latter lectures present the same features as those which have passed before us cursorily in review. They bear the imprint of being the results of personal experience, as do the others, and contain many hints as to minute details—hints which are so often more valuable to the perplexed surgeon than the elaborate statements of a more systematic work.

Appended to the book is a leaflet, reprinted from the *Lancet*, containing an account of an ingenious instrument, invented by Mr. Harrison, to insert medicated pessaries or suppositories into the bladder.

In conclusion, it remains but for us to reiterate the opinion already expressed, that this modest book is a valuable contribution to surgical knowledge, and entitled to the highest confidence of the profession.   S. A.

ART. XXX.—*Contributions to the Physiology and Pathology of the Breast and its Lymphatic Glands.* By CHARLES CREIGHTON, M. B., Demonstrator of Anatomy in the University of Cambridge. 8vo. pp. 200. London: Mac-Millan & Co., 1878.

IN this volume, which is a revised reprint of several papers which were published under the auspices of the Medical Department of the Privy Council and in the *Journal of Anatomy and Physiology*, Dr. Creighton, who appears to be a painstaking, conscientious, and original investigator, sets forth most novel and heterodox views in regard to the development of the mammary gland and the pathological processes concerned in the histogenesis of neoplasms, which, if they should prove to be true, will upset our present ideas as to the morphological attributes of the blastodermic layers and the elements from which tumours are derived.

In the first part of the work, which is strictly physiological, the author shows that during the early periodical evolution of the breast, the secreting epithelium proliferates after the manner of endogenous cell-formation or vacuolation, and that large granular cells containing yellow pigment, which represent waste products, result, which leave the acini bodily to infiltrate the interacinous and interlobular connective tissue, whence they enter the lymphatics and are transported to the associated lymphatic glands to be converted into lymph-cells. During the last stages of evolution, as the epithelium is returning to its quiescent state, typical vacuolation of the epithelium is going on with the formation of mucus, until finally the state of involution is reached, when the epithelium resumes its polyhedric form.

In opposition to the generally accepted opinion that the development of the breast is due to the infolding or extension downwards of the ectoderm, epiblast, or outer layer of the embryo, Dr. Creighton concludes, from investigations conducted upon the kitten and Guinea-pig, the steps of which inquiry we need not follow, that the glandular elements, or acini, are developed from the embryonic cells that give rise to the connective tissue framework of the gland; in other words that they originate from the mesoblast or hæmoblast. This view, which is so utterly at variance with that of Remak, His, and other observers, it need scarcely be said, must be received with caution.

The second part of the work is devoted to the consideration of the pathological processes of the breast, as exemplified by the mode of origin of various morbid growths, and is based upon the study of twenty cases of mammary tumours in the bitch, two in the cat, and eight in the human female breast. As a result of functional irregularities, there is a kind of spurious evolution from the resting state, as is indicated by the production of large granular pigmented cells, as occurs in the physiological unfolding of the gland. These waste epithelial products, by their accumulation either in the acini or the periacinous connective tissue, give rise to tumours. If they distend the acini, encephaloid cancer results; if, on the other hand, they infiltrate the surrounding tissue, scirrhous cancer is produced. Coming still nearer to the full excitation, and parallel with the mucous changes in the vacuolated cells, myxoma is developed; while the highest scale of excitation is marked by the formation of enchondroma.

Not only does Dr. Creighton derive the above-mentioned neoplasms from the waste products which result from the vacuolation of the epithelial cells of the acini, but he regards the small-celled infiltration of the periacinous connective tissue as consisting of the same waste cells, in opposition to the view that it is due to wandering cells or leucocytes. He, moreover, maintains that the pigmented cells which have escaped bodily from the acini into the surrounding tissue may assume an

oblong or spindle shape, and that the cells of sarcoma merely represent a morbid type of epithelium.

With regard to secondary infection of the lymphatic glands, the author teaches that the pigmented cells are transported to the lymphatic glands, where they either act as foci of the new growth, or by contact, that is by the so-called spermatic influence, infect the lymph-cells and convert them into tumour elements.

We have thus, in the space allotted to us, endeavoured to give a synopsis of the peculiar views of the author, and must refer our readers for more minute details to the work itself, which is deserving of the most attentive and thoughtful perusal.

S. W. G.

Art. XXXI.—*Recent Works on Operative Surgery.*
 1. *A Manual of Operative Surgery.* By LEWIS A. STIMSON, B.A. (Yale), M.D., etc., Surgeon to the Presbyterian Hospital, etc. 12mo. pp. 477. Philadelphia: Henry C. Lea, 1878.
 2. *Practical Surgery: including Surgical Dressings, Bandaging, Ligations, and Amputations.* By J. EWING MEARS, M.D., Demonstrator of Surgery in Jefferson Medical College, etc. 12mo. pp. 279. Philadelphia: Lindsay & Blakiston, 1878.

1. To prepare a manual of operative surgery "sufficiently complete, as regards both the number of operations described, and the details of the descriptions, to meet the wants of the practitioner and of the student," that in length shall not exceed 450 duodecimo pages of large type, including over 300 engravings of various sizes, is certainly no easy task; indeed it is very questionable if it can be done.

The book before us is a very fair attempt at fulfilling the requirements, and has pleased us better the more we have examined it. It includes chapters on the *accessories of an operation, ligations, amputations, excisions, neurotomy and tenotomy, plastic operations,* and the *special operations* upon the various parts of the body. The selection of operations is, in the main, judicious, and the descriptions generally clear and yet concise. Had the author had a large personal experience in the making of the various operations described for the relief of particular diseases, injuries, or malformations, and consequently been better able, knowing their several advantages and disadvantages, to give their relative value, the usefulness of the book to both practitioners and students would certainly have been much increased. A work on operative surgery should, in our judgment, be the last ripe fruit of a long and active surgical career.

Let us briefly notice some of the views and statements of the author.

In writing of the Esmarch bandage, it is declared that after the cut vessels have been tied, "the oozing arrested with ice-water, and the wound closed, no bleeding need then be feared." Unfortunately, every once in a while, bleeding does occur, and in the fact that such may take place lies a very serious objection to the use of the bandage, so serious that some of our best surgeons have because of it abandoned the "bloodless method" in certain cases of excision, particularly of the knee-joint. It might have been well to have noticed in this connection the use of *hot* water and the galvanic current as hæmostatics.

Should one have occasion to ligate the abdominal aorta, he is advised to operate in the original way, going straight down in the median line through the two layers of the peritoneum. In treating of ligature of the femoral artery, Hunter's canal is said to be " the condensed sheath for a short distance above and below the

point where the artery passes through the adductor magnus." By English and American anatomists (the most of them certainly) the canal of the adductor is not called Hunter's, such name being applied to the long triangular interspace between the vastus internus and the adductor, extending from the apex of Scarpa's triangle to the opening in the adductor magnus.

Referring to cerebral localizations as aids to trephining, there is expressed, we believe, the general sentiment of the surgical world, when it is said that "the weight of authority is decidedly against any interference based solely upon such theoretical considerations." The line of the fissure of Rolando is very conveniently described as that of "the hypothenuse of a right-angled triangle, whose base is the upper half of a line drawn from the bregma to the meatus auditorius externus, and whose perpendicular extends two inches backwards from the bregma along the median line."

External perineal urethrotomy without a guide, it is said, "is not often required;" as "the cases are very rare in which a filiform whalebone bougie cannot be passed through a stricture which allows urine to pass." True as this is theoretically, practically for physicians in general it is not quite so true, and a very tight stricture is to the majority of those not specially skilled in urethral manipulations an impermeable stricture; and they must either make external urethrotomy without a guide, tap the bladder, get help, or let the patient die. With reference to tapping the bladder, it seems to us rather surprising that while the supra-pubic, sub-pubic, and rectal operations are described, not a word is said about aspiration, the quickest, safest, and by far the least dangerous of all methods of emptying an over-distended bladder when a catheter cannot be introduced. A page and more is devoted to the description of the McBurney operation for rectal puncture, an operation that can only be made when the urethra will permit of the passing through it of a fair-sized catheter, and intended, we presume, for cases in which it is desired to keep the bladder empty.

In treating of *supra-pubic lithotomy*, it is stated that "the danger of infiltration of urine must be met by drainage of the bladder. The usual method is to introduce a soft-rubber catheter through the urethra, but this often proves very irritating, and Dr. Keyes prefers to drain through the rectum." Dulles, who has recently and so carefully investigated this subject, says: "The urine should be drawn off from the bladder at short intervals, until the wound is consolidated. A catheter should by no means be left in the urethra. . . . . The dangers of urinary infiltration and peritonitis" are "greatly overrated." In this connection we might inquire how often Dr. Keyes has made *supra-pubic* lithotomy, and upon how much experience he bases his preference for one method of draining rather than another. We do not remember to have seen any reports of such operations made by him. Dr. Stimson says, "No sutures should be placed in the bladder;" Dr. Dulles that "sewing up the bladder is of decided advantage. . . . . The most brilliant results have been secured by carefully closing the wound in the bladder with sutures."

We are surprised to notice that nothing is said of the operations made for the relief of anal fissure and of fistula in ano; operations of much more importance to the student and general practitioner than that of Michel for division of the inferior dental nerve, or of Wood for the radical cure of hernia. We are also a little surprised that no reference is made to Carnochan's operation upon the second branch of the fifth nerve, especially when we read that "*Dolbeau* divided the nerve with curved scissors on the central side of the branches going to the spheno-palatine ganglion, and tore out the ganglion by drawing upon the nerve." If there is any special advantage in the removal of the nerve back to the foramen rotundum (which our investigations lead us to believe there is not) the credit of originating the operation belongs to Carnochan.

2. An excellent unpretentious little book on *dressings, bandaging, ligations,* and *amputations,* for which students will certainly be thankful to Doctor Mears. The anatomical relations of the parts involved are well though briefly stated, the landmarks are clearly pointed out, and the various steps of the operations are so given that they can readily be understood and followed.   Perhaps a somewhat more detailed account of the necessary operative procedures in some of the ligations and amputations might have advantageously been given.

In describing the course of the facial artery, it is said to pass through the submaxillary gland.   Generally it simply grooves the upper surface of the gland.

No mention is made of the incision below and parallel to Poupart's ligament in ligation of the common femoral, an incision that we think is preferable to the one described.

The incision for reaching the popliteal in its lower third is directed to be made in the median line.   If a little to the outside of that line it will be more exactly over the interspace between the two heads of the gastrocnemius.

It would have been well, in describing the operation for ligaturing the posterior tibial by cutting through the tibial origin of the soleus, to have spoken of the existence of the fibrous septum of that muscle, which is not infrequently mistaken for the inter-muscular fascia.

In detailing the steps of the Chopart amputation, the student should have been warned against the danger of carrying the knife too far in the line of the curve between the astragalus and scaphoid, with the result, of course, of getting into the space between the astragalus and os calcis and striking against the latter bone. We have seen this so often done by students that we are sorry that Dr. Mears did not refer to it.

In amputation at the shoulder-joint it is, as usual, stated that the subclavian artery is to be compressed against the first rib.   The hemorrhage, as we know, can be easily and thoroughly controlled by carrying the narrow Esmarch band or cord around the axilla close to the body.

The illustrations in the book are numerous, and most of them fully as good as might reasonably have been expected.   P. S. C.

Art. XXXII.—*Harvey and his Discovery.*   By J. M. Da Costa, M.D., Professor of the Practice of Medicine at the Jefferson Medical College, Philadelphia.   8vo. pp. 57.   Philadelphia: J. B. Lippincott & Co. 1879.

The recent occurrence of the tercentenary of the birth of Harvey has been the fruitful occasion of many disquisitions upon the discovery of the circulation of the blood.

The story of Harvey's life and labors is always full of interest to the student of medical history, and in the little volume which heads this notice "the old, old story" is told in the best style of its accomplished author.   It consists of an address delivered at the opening of the present session of Jefferson Medical College by Dr. Da Costa, and with the addition of some illustrative notes is now offered to the public in its present neat and attractive form.

Any presentation of Harvey's claims possesses more than ordinary interest now on account of the numerous impeachments of his title which have been recently published.   Quite recently we have seen the erection of a memorial tablet to Carlo Ruini, and monuments to Andrea Cesalpino and Harvey, each proclaiming its honoured dead to be the discoverer of the great truth.   Servetus, the erra-

tic Spaniard, whose "figure stands out in history as one of the most striking of the sixteenth century," has again found an able advocate in Henri Tollin, of Magdeburg. These are all, however, revivals of the same claims of which Haller long ago said: "Others at length, that could not withstand their own eyes, and the just sentence of all Europe in its favour, were invidiously for depriving our British Hippocrates of the honours due to so great discoveries, by fishing them out from the dark waters of his predecessors." (An Historical Introduction, etc., Physiology, vol. i.)

Dr. Da Costa uncompromisingly rejects all these claims, and accords to Harvey's genius all the glory which clusters about a discovery "without which there could be no such thing as scientific medicine." The address is naturally divided into two parts; in the first of which is briefly sketched the private and professional life of the *man* Harvey, while the second part treats more particularly of Harvey the *discoverer*.

Into both divisions, but especially the first, we have pleasantly interwoven much interesting information concerning the times and contemporaries of the illustrious Harvey.

In studying the life of Harvey we have always found the account of his conduct at Edgehill a heavy tax on our credulity. It is related upon the authority of the tattling Aubrey that during the progress of the battle he withdrew with the sons of King Charles, under a hedge, "and tooke out of his pockett a booke and read. But he had not read very long before a bullet of a great gun grazed on the ground neare him, which made him remove his station." While there are many things that lead us to believe that Harvey was not in hearty accord with the King's efforts to overthrow Parliament and English Puritanism, yet he could scarcely have been so indifferent to the fortunes and personal safety of his faithful friend and patron as the above act would indicate. Making due allowance for his age (sixty-four years), we certainly would not expect to find "the greatest of the great physicians of comparatively modern times, perhaps of any time" (p. 56), quietly reading in a safe retreat, when the promptings of common humanity would have called him to the side of the wounded and dying. While Dr. Da Costa himself seems to have some doubts about the truthfulness of the story, he offers the following interpretation of Harvey's conduct, which differs from the one usually given. "No, if Harvey acted as he has been said to have acted, he did so because he wished to give confidence to the young Princes and to impart to them his own coolness." (p. 23.)

We fail to see wherein this explanation places Harvey in any better light; and moreover the ages of the children would militate strongly against the above supposition. The children were the Prince of Wales, and the Duke of York, afterwards Charles II., and James II. of England, and on the occurrence of the fight at Edgehill (1642) were aged respectively twelve years and nine years. If the action of Harvey was for the purpose indicated by the author, his bungling method of infusing confidence into mere children can only be explained by the fact that Harvey himself was childless, and hence inexperienced as a nurse. In fact the whole account reads more like a *myth* than a *reality*, and certainly ill accords with the character of Harvey as portrayed in the address before us. It is highly probable and certainly more charitable to believe that the story, to say the least of it, is highly coloured by the vivid fancy of the gossiping Aubrey.

The reader is doubtless familiar with the able and learned paper in the July number of this Journal by Dr. Forbes, in which he seeks to show, in opposition to the general verdict, that Harvey was fully acquainted with and the first to point out the capillary circulation. Dr. Da Costa takes exceptions to this view, and in a lengthy foot-note states his reasons for its rejection. The whole question hinges

upon the meaning which Harvey attached to the word *porositates*, the porosities through which he thought the blood to flow from the arteries into the veins. While we acknowledge our incompetency to act as referee in this *battle of words*, it seems to us that other proofs will have to be brought forward before we can credit Harvey with actual *knowledge* of the complete circuit of the blood, yet it must, in justice, be admitted that certain passages quoted by Dr. Forbes look amazingly as if he did possess such knowledge. In conclusion, we would heartily recommend this address to any who wish to spend a pleasant and profitable hour with the "Father of modern physiology."   W. J. C.

ART. XXXIII.—*The Theory and Practice of Non-Restraint in the Treatment of the Insane.* By W. LAUDER LINDSAY, M.D., F.R.S.E., Physician to the Murray Royal Institution, Perth. From the *Edinburgh Medical Journal*, April and June, 1878.

Restraint in the Treatment of Insanity. By G. F. BODINGTON, M.D., Member of the Royal College of Physicians. From the *Birmingham Medical Review*, October, 1878.

WE have been often told that in the management of the insane in the hospitals and asylums of Great Britain, the use of mechanical restraint upon the person was entirely abolished. The fact has been widely proclaimed as a great and glorious advance in the cause of humanity, challenging the admiration of the world. Any doubts as to the humanity or wisdom of this remarkable step have always been attributed, with a rather pharisaical air, to indolence, unskilfulness, or a lack of any nice discernment of the ways and feelings of the insane. It is forty years and more since complete non-restraint was first begun to be practised in England, and yet the example has found no followers in this country, and few, if any, on the continent. Indeed, we have learned at last, notwithstanding the abounding confidence expressed in it by writers in books and periodicals, by superintendents of hospitals, and commissioners in lunacy, and the severe strictures, coming from such sources, upon all, and especially us on this side of the water, who are unable to see it in this light, that the method of complete non-restraint is far from being universally followed even in England. We have more than suspected this in spite of its positive denial by many who were supposed to speak by authority. We more than suspected that this idea of abolishing all restraint upon the insane, now and forever, was pervaded by a large element of the sensational, and that influences outside of the hospitals had more to do with it than the practical experience of their officers. That we were not mistaken is abundantly shown by Dr. Lindsay, who tells us that restraint is used in many of the largest hospitals and private asylums in England and Scotland, and even in some where it is supposed to be prohibited. His testimony, accompanied as it is by names, and other circumstances, settles this question, and we hope never more to be reproached for not following a method of management triumphantly established in Great Britain by universal consent. It is no part of our purpose at present to follow Dr. Lindsay in his exposition of the subject, showing as it does, besides the fact that restraint is not there abolished, the mischief arising from its disuse, and the benefit obtained from its judicious use. We only wish to show that the statement so confidently made, both here and abroad, respecting the abandonment of all mechanical restraint, is not true, and that the obloquy attempted to be fastened upon us for preferring the old ways is utterly undeserved.

Dr. Bodington, the honoured superintendent of a large private asylum, charges the non-restraint system with being the parent of many mischievous practices—violent struggles between patients and attendants, wounds, bruises, broken ribs, and prolonged irritation. He declares most truly that if a patient is to be restrained it had better be done by means of leather or canvas than by the hands of attendants, because the latter are apt to provoke opposition and struggles, even under the most favourable circumstances. But until it is possible, as the Doctor says, to obtain angels as attendants, we need not expect the unintermitting forbearance and unvarying command of temper demanded by Conolly and his followers. The radical fault with the non-restraint people is, unquestionably, "that they do not confront the realities of the case. They try, on the contrary, to fit everything to theoretical, ideal, imaginary views."

What we prize most in these pamphlets is their outspoken protest against the arrogant assumptions of the advocates of non-restraint that they alone are wise, even beyond any possibility of mistake or doubt, supported as they are by a strong popular sentiment, while their opponents, including most of the honoured names in this field of professional labour, in Germany, France, and America, are behind the age, guilty, every day, of cruel and barbarous practices. We honour the courage implied in a stand like this, for it is a stand in favour of the right of private judgment, as sacred in the field of scientific inquiry as it is in that of politics and religion. The time is coming ere long, we trust, when it will seem almost incredible that, in this our time, men were debarred, by force of a rigid proscription, from using a remedial measure which they considered as conducive to cure and comfort as any drug or article of food.   I. R.

ART. XXXIV.—*A Manual of Anthropometry, or a Guide to the Physical Examination and Measurement of the Human Body.* By CHARLES ROBERTS, F.R.C.S. 8vo. pp. xxiv., 118. London: J. & A. Churchill, 1878.

MR. ROBERTS is pursuing a valuable line of research, and has already done excellent work in his "Physical Requirements of Factory Children," and "Physical Development and Proportions of the Human Body" (see this Journal, Oct. 1877, p. 492). The book before us is written for the purpose of stimulating, and so to speak, co-ordinating the work of those who are interested in this department of knowledge. When a sufficient mass of facts shall have been accumulated, his intention is to write a standard work on the proportions of the human body as ascertained by facts gathered from as many and as widely diverse points as possible, together with discussions on the influences of climate, occupation, food, age, etc., and finally the application of these facts to the improvement of health, and the establishment of an artistic canon of proportions. In its statements of facts, there is little to be noted that has not been referred to in the notice already cited. The chief object of the work is to give scientific accuracy and identity to the various measurements taken, by means of an excellent chart that is prefixed to the book, and by the directions for its use that are found in the text. As we would naturally expect in one who advocates so warmly and so justly the introduction of exact measurements, both of weight and length, he is himself extremely exact and careful. Thus, he does not forget the influence of eating and fasting on the weight, the different weight of the clothing at different ages, or the difference in the circumference of the biceps, and other muscles, after exercise and before. The only indefiniteness we have found is in using "the malleolus"

in measurements of the lower extremity.   The exact point on so large a surface should have been specified.   We notice also two curious spellings, "trypode" (p. 34), and "enciform" (p. 48), neither of which finds any etymological justification.   A very complete bibliography is prefaced to the book, for much of which the author is indebted to the report of Dr. J. H. Baxter, U. S. A., and forms an invaluable addition for those who are engaged in any allied work.   We commend the book heartily to all who are interested in the subject, as by far the best on the subject that we know.   It is no little comfort, also, to read a book which has such excellent paper and type.   W. W. K.

ART. XXXV.—*Relative Frequency of Colour-Blindness in Males and Females.* By B. JOY JEFFRIES, M.D., Ophthalmic Surgeon to Massachusetts Eye and Ear Infirmary, etc.   Reprint from *Boston Medical and Surgical Journal,* July 25, 1878.

IN a recent article on the dangers of colour-blindness, reviewed in the last number of this Journal, Dr. Jeffries stated incidentally that "it has frequently been said that colour-blindness was less common among females than males.   This is *probably* incorrect, and due to the fact that such a defect is of more importance with the female sex, and, therefore, more carefully concealed.   They have not been tested as males have ; and most likely future statistics, based on true methods of testing, will refute the now quite general impression as to their having better colour perception, and hence to be preferred, when admissible, as railroad employés."   Prof. Holmgren, while he does not deny the correctness of the general impression that colour-blindness is less frequent among women than among men, and even admits its probability, says that the necessary information to establish the fact is yet wanting.   (Colour-blindness with Relation to Accidents by Land and Sea, translated in *Report of Smithsonian Institution* for 1877.)

Until quite recently the most extended observations bearing on this point were those of Dr. H. Dor, of Bern, who, in 1860, reported that in an examination of 611 women he had found less than one per cent. colour-blind.   The method of examination adopted was practically the same as that of Holmgren, being based upon the sorting of coloured worsteds.   Any test based on the naming of colours might be held to prove only that women have greater quickness and readiness, and a greater familiarity with colours than men have.   In the determination of this and similar questions, the importance of using a rational test, and having it carefully and skilfully carried out by competent persons, cannot be too strongly insisted upon.   It is by no means so easy and simple a matter as might at first sight be imagined, and Prof. H. complains of the inefficient use of his method of testing, even by prominent ophthalmic surgeons.   An explanation of the principles of this method, and full directions for carrying it out, can be found in the pamphlet above referred to.

The results reported by Dr. Jeffries speak in no uncertain voice in favour of the comparative immunity from colour-blindness enjoyed by women.   His examinations were made in various educational institutions, and showed that in 1021 males the proportion of colour-blind was one in twenty-two, while but a solitary case was found among 1025 females.

He also quotes from recent reports of Drs. Cohn and Magnus, who found only one colour-blind among 2318 school girls tested in Breslau.

Dr. Jeffries is still engaged in this work, and up to the present date has tested

1892 females, and has found only two cases of colour-blindness among them. This, in connection with the examinations at Breslau, gives a result of only three colour-blind among 4210 females.

This question is by no means a matter of mere idle curiosity, but may have an important physiological bearing. If more extended researches establish this strong contrast between the sexes it cannot, of course, be considered the result of chance, but must have some principle behind it. The only theory proposed is that of heredity, which supposes that as women are, as a rule, much more occupied with colours than men are, the greater exercise of the chromatic sense results, in the course of generations, in its more perfect development and less liability to imperfections. This theory has already been used as an argument by those who maintain that colour-blindness may be cured or diminished by exercise with colours. This argument seems to us not a very strong one, as the effect of constant use through many generations may readily be admitted without implying that a corresponding tendency is perceptible in the individual. The fact of the extremely rare occurrence of this defect in females may be more available, however, for those who advocate, with Geiger and Magnus, the evolution of the colour sense, though we believe it has not yet been pressed into this service.

Wallace says (*Tropical Nature and other Essays*) that "the fact that colour-blindness is so prevalent is an indication that the fully-developed colour-sense is not of primary importance to man. If it had been so, natural selection would have eliminated the defect," or at least lessened the liability to its recurrence. It will scarcely be held that a fully-developed colour-sense is of more vital importance, in the struggle for existence, to women than to men. Perhaps, after all, it will be easier, at least, to take an æsthetic view of the question, and to admit that a full appreciation of all the glories of the solar spectrum is simply more demanded by the higher nature of the gentler sex, and that "the emotions excited by colour and by music, alike, seem to rise above the level of a world developed on purely utilitarian principles."   G. C. H.

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ART. XXXVI.—*A Handbook of Nursing for Family and General Use.* Prepared under the direction of the Connecticut Training School for Nurses, State Hospital, New Haven. 8vo. pp. 266. Philadelphia: J. B. Lippincott & Co., 1879.

A THOROUGHLY good book by an experienced and thoroughly sensible man, whoever he be that has written it. It provides not only for the now large and rapidly increasing class of intelligent professional nurses much good advice and instruction concerning nearly everything they will have to do, but it will be even a greater boon in many respects for those who are compelled to nurse their own families or friends, who desire to do the best possible service, but, from inexperience and want of teaching, know not what to do.

The book is divided into three parts: I. Medical and Surgical Nursing; II. Monthly Nursing; and III. Family Hygiene. Under the first head, not only every ordinary hint is given, but the nurse is taught how to use the thermometer, to take the pulse and respiration, what to observe about them, and the meaning of the chief deviations from the normal, and what should be observed and reported as to the urine. Special directions are given as to surgical nursing, as to nursing in certain medical diseases, as to the nursing of children, as to disinfection, and finally, rules of conduct in emergencies.

The second part is really not a handbook for nurses so much as for midwives, but is very good and plain. The third part is limited in its scope, but good as far as it goes.

In way of criticism, we could wish here for an earnest protest against school and family usages which are making more than half our educated people myopes. In the first part a useful addition would be an excellent plan for keeping a tumbler of cracked ice by a flannel funnel reaching nearly to the bottom of the tumbler, with a small hole to let the water out. Directions as to what should be observed and reported as to the feces are also quite as important as the urine. But a really serious fault is the direction (p. 41) for passing an enema syringe point: "Apply first in a backward direction and then forward a little, very gently." "Precisely wrong," as our old Professor of Latin used to say but too frequently to us. The direction of the rectum for the first inch from the anus is in a line from the anus to the umbilicus, and then curving sharply backwards it follows the concavity of the sacrum and coccyx. The directions should therefore read: "Pass the point into the anus for one inch in the direction of the navel and then swing it round so that it will point upwards and a little backwards, when it should be gently pushed on." For want of this simple knowledge on the part of both nurses and doctors, many a patient dreads an enema instead of finding it not only painless but a source of great relief.   W. W. K.

ART. XXXVII.—*On the Therapeutic Forces; an Effort to Consider the Action of Medicines in the Light of the Modern Doctrine of the Conservation of Force.* By THOMAS J. MAYS, M.D., Member of Luzerne County Medical Society, etc. 8vo. pp. 143. Philadelphia: Lindsay & Blakiston, 1878.

FROM the remote period when physicians first began to think of the mode of action of remedies until the present, there have not been wanting theories and speculations concerning the *modus operandi* of medicines. But the adoption of late years of improved methods of study, marked by the introduction of instruments of precision into pathology and practical medicine by which morbid states and processes are clearly recognized, has finally established, with the aid of the accumulated testimony of experiments on living animals, a fund of common knowledge of the action of remedies, upon which it would seem that, now if ever, the foundation for a therapeutic science might be safely laid. Add to this the advance in physiology proper, more particularly towards an exact knowledge of the chemistry and dynamics of food, and a hint is obtained of the direction in which therapeutists have been seeking for the clue to guide them from the mazes of empiricism.

The works of Ringer, Bence Jones, Brunton, Wood, Fothergill, and others have contributed greatly to placing Rational Therapeutics upon a sound basis, and aided in creating a healthy sentiment against the tendency to an aimless administration of active agents and routine prescribing. Dr. Mays, in the first portion of this little volume before us, recites some of the experiments and processes by which the force-producing qualities of the different proximate principles have been ascertained and estimated, and associates with them Prof. Tyndall's conclusions from his consideration of Heat as a Mode of Motion, which, by the way, evidently furnishes the inspiration for the present work.

The study of the action of remedies would be much simplified by the general adoption of Dr. Mays's theory, which is "that our therapeutic forces, when

viewed from the standpoint of life, can be divided into two great classes, viz., those which move in harmony with the vital forces, and those which move in antagonism to them;'' which is simplicity itself. The application of the theory depends upon this fundamental principle, in the author's words, '' Now, muscle, same as every other compound body, is molecular in its elementary structure.'' Like the execution of Charles I., which was so difficult to keep out of Mr. Dick's celebrated memorial, we notice this molecular motion cropping out repeatedly in unexpected places on almost every page of the book. Grouping therapeutic agents under his theory of their action, we find that chemical stimulants, including hydro-carbons, carbo-hydrates, alcohol, phosphorus, and oxygen, all produce molecular motion of a distinct kind from mechanical stimulants, which title covers quinia, quassia, barberry, columbo, gentian, nectandra, and others such as ammonia, iodine and the iodides, cold, opium, antimony, croton oil, cantharides, mustard, turpentine, tar, poultices, baths, friction, etc. In the course of the consideration of the action of these agents, however, it is just to state, that many very useful and practical hints are given, apart from any theory. The mode of action of quinia is thus graphically stated:—

" Quinia, in small doses, is analogous in its action to a mild force of wind blowing across a field of tall grass. That it moves in a direction contrary to that of, and comes in contact with, the weaker molecular forces in the body, and motion necessarily takes place in the line of least resistance, which is in consonance with that of the attacking force, until at such a point where a momentary equilibrium is restored by the action of the bodily force, after which motion takes place in an opposite direction. By the prolonged action of quinia a series of such oscillations or waves is produced, and in this way the bodily molecules are impelled to their former degree of energy and activity; they thus acquire an additional amount of strength, which will remain even after the attacking force has subsided.''

So much for quinia. As soon as the therapeutist can see the remaining elements of the materia medica in this particular light, the acknowledgment of the correlation of the therapeutical with the remaining physical forces becomes imperative. As for the doctrine of the conservation of force, if it does not thereby receive further confirmation, it will be gratifying, at least, to remember that, as a fundamental principle, it does not need it.   F. W.

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ART. XXXVIII.—*The Antagonism of Therapeutic Agents, and What it Teaches.* The Essay to which was awarded the Fothergillian Gold Medal of the Medical Society of London for 1878. By J. MILNER FOTHERGILL, M.D. Edin., Assistant Physician to West London Hospital. 12mo. pp. viii., 160. Philadelphia: H. C. Lea, 1878.

DR. FOTHERGILL'S Essay on the Antagonism of Medicines is essentially a compilation of some of the more important experiments which have been made upon this subject, with special consideration of the principles which should govern the practical application of the facts thus deduced to treatment of cases of poisoning and the therapeutic principles resulting from their study. The application of the results of experimental investigation to the data of clinical experience is always profitable, and while those who are moderately conversant with the literature of his subject will find in Dr. Fothergill's book little, if anything, that is novel, those who have not been so diligent will here find much that is improving, while all is interesting.

We cannot but think, however, that those who are not familiar with the sub-ject of the author's work, will obtain from it but a confused notion of the actual facts of the case and the immense importance of the principles involved.   A few tabular statements of the contrasted *modus operandi* of the different drugs would have greatly increased the value of the work to those who wished merely to re-fresh their memory, while they would have been invaluable to those who under Dr. Fothergill's guidance enter this field of study for the first time.

<div align="right">R. M. S.</div>

ART. XXXIX.—*Phosphates in Nutrition, and the Mineral Theory of Con-sumption and Allied Diseases.* By M. F. ANDERSON, L.R.C.P. Ed., and M.R.C.S. Eng. 8vo. pp. 178, xxvii. London: Baillière, Tindall & Cox, 1878.

THE fact that the value of a food is dependent not only upon its organic, but also upon its inorganic constituents, is generally acknowledged; and experimental physiology by means of exact observation and chemical analysis has pretty clearly defined the role of each class of proximate principles in nutrition.   A series of experiments undertaken by the author, to ascertain the use of phosphoric acid in animal and vegetable life, placed in his possession certain data, which subse-quently led him to entertain views somewhat different from those generally held concerning the part played by the phosphates in nutrition, and which appeared to offer a novel explanation of the cause of certain diathetic diseases; such as con-sumption, scurvy, and wasting disorders generally.

Contrary to the generally received opinion that a small amount of uncombined phosphorus exists in the blood and in the brain as phosphorized fat, or lecithine (Hoppe-Seyler), and protagon, Dr. Anderson concludes that "phosphorus has no existence in the elementary state, or in any other form than that of phosphatic acid or a phosphate, in either the vegetable or animal kingdom."

The success of scientific agriculturists in feeding plants, from the application of knowledge obtained by the chemical analysis of the soil, and of the plant itself, leads to the query, "Cannot the doctrines of agricultural chemistry be turned to profitable account in investigating the requirements of the different tissues for in-organic material, and ascertaining how far the different kinds of food fulfil their requirements?" which is the line of investigation pursued in this work.

In the processes of nutrition the capillaries are the agents directly concerned. In all tissues and organs containing capillaries, phosphoric acid in a tribasic state of combination, with lime, magnesia and soda or potassa, is constantly present; this is termed "tissue phosphate."   The capillaries are not separable from the sur-rounding structures for examination; but as it was found that the endothelial lining of the arteries contained a large amount of this salt, the inference is drawn from this and other considerations that "the presence of tribasic phosphate in all the organs of the body is dependent on its entering into capillary formation." Great stress is laid upon capillary innutrition as the cause of certain organic dis-eases, for the following reasons, as stated by the author:—

"The inorganic chemistry of the tissues shows the presence of tissue phos-phate in the arteries, and in all the vascular tissues, and in no other tissues is it to be found; food shows the source of this phosphoric supply; and the urine of man gives evidence of the constant presence of the component parts of this triple salt, evidently as the result of tissue metamorphosis, independently of food in-fluence.   In all cases of death from any of the diseases included in the list given,

where I have had opportunities of examining the vascular tissues, there showed mineral deficiency as compared with corresponding healthy tissues.''

In the treatment of wasting diseases, the usefulness of the hypophosphites and phosphoric acid is recognized, but phosphoric acid alone cannot form the tissue phosphate ; the whole salt should be given, or all the materials for its formation supplied. In the same manner ''hypophosphorous acid has no place in tissue formation, it is only by conversion into phosphoric acid that it can be utilized,'' and in fact the recorded cases show that where it has been most successful, ''it has been given under conditions to utilize the acid and the base, as factors of tissue phosphate.'' Notes of several cases of consumption treated by the tissue phosphate are given where its administration was followed by marked benefit ; and hopes are held out that by this means incipient phthisis may be permanently relieved.

A difference of opinion may exist concerning the view entertained by Dr. Anderson of the rationale of the administration of lime juice in scurvy, but as the conclusions are not affected by it, we need not here stop to discuss it.

This little work represents a large amount of patient, well-directed, original investigation for which the author deserves much credit. The results of his studies and analytical researches tend to throw light upon the causes of obscure constitutional diseases, and lay the groundwork for a more rational method of their treatment.   F. W.

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Art. XL.—*Transactions of State Medical Societies.*
1. *Transactions of the Medical and Chirurgical Faculty of the State of Maryland*, April, 1878, pp. 208. Baltimore, Md., 1878.
2. *Transactions of the South Carolina Medical Association*, April, 1878, pp. xlvi., 89. Charleston, S. C., 1878
3 *Medical Communications of the Massachusetts Medical Society.* Second series, Vol. viii., Part iv. Boston, Mass., 1878.
4. *Transactions of the Medical Society of the State of California*, 1877–8, pp 275. Sacramento, Cal., 1878.
5. *Transactions of the Medical Society of the State of North Carolina*, May, 1878, pp. 103. Wilmington, 1878.
6. *Transactions of the Medical Society of the State of New York* for 1878, pp. 339. Syracuse, N. Y., 1878.
7. *Transactions of the Medical Society of New Jersey* for 1878, pp. 390. Newark, N. J., 1878.

1. THE neat issue of the *Maryland Faculty* contains a loving and appreciative *Notice of Dr. Nathan R. Smith*, who recently died at the age of eighty. The memoir is by Dr. S. C. Chew, brief, well written, and accompanied with a photographic portrait.

Dr. A. P. Smith, in a paper describing his *Fifty-two Successful Cases of Lithotomy*, gives an account (with illustrations) of a case of *double bladder and double penis*. The scrotum and testes were normal. The twin external organs were rather small, destitute of prepuce, and at first sight perfectly symmetrical. In one, however, the urethra was found normal, while in the other it ended just in front of the scrotum. At the choice of the patient urine could be voided from either The excretion varied in quality, so much as to demonstrate complete separation of the two bladders. There was some deficiency of the abdominal walls in front of the bladder. A more exact description of many points in this

case would have been very interesting. Dr. Smith attributes the uniformity of his success to the use of the lithotome invented by his father, Dr. N. R. Smith.

Two cases of extroverted bladder are reported by Dr. Monmonier.

Dr. Friedenwald calls attention to *spasm of accommodation* as an optical trouble not always understood. Its occurrence and character in young school children are especially noted.

Dr. Thos. Brown condemns divulsion as a treatment of urethral stricture. Internal urethrotomy is much preferred. In forming his opinion he has been aided by a large body of correspondence from eminent surgeons.

Dr. Jos. A. White reports, with illustrations, a terrible case of bony tumour in the face of an infant, causing the loss of an eye and horrible deformity.

Dr. L. McLane Tiffany reports success in removing *naso-pharyngeal polypus* by Cheever's method, temporary depression of the entire upper jaw being resorted to, to procure room, and tracheotomy employed as a preliminary.

We regret that lack of space forbids notice of several other valuable papers.

2. We learn from the *South Carolina* publication that the profession, and intelligent business men of the Southern States deeply feel the need of judicious National legislation, to replace the present conflicting and often unwise quarantine regulations of different localities. In response to petitions Congress did pass a bill requiring consuls to report the prevalence of epidemics to the Bureau of Marine Hospital Service. But it surely comes within the scope of Congressional right and duty to assume the entire charge of public health in all States, so far as affected by commercial relations.

Perhaps the principal paper in this collection is upon *Yellow fever, as observed at Port Royal in* 1877, by Dr. M. Simons. Fully satisfied that at some times and places epidemics have presented features of a hybrid or malarial or doubtful character, the writer states that on this occasion the cases were all typical. Malarial fevers appeared, as usual, running their course as if wholly unaffected by the epidemic. The effects of a stiff dose of quinia would always settle the question of diagnosis. The yellow fever attacked none who had suffered previous attacks of undoubted genuineness. Dr. Simons attributes the epidemic distinctly and solely to importation by means of vessels. Other theories of causation are pretty thoroughly examined, but do not seem to fit the facts.

Dr. Kinloch reports a curious case, supposed to be one of rupture or *injury to the external iliac artery*, though without any lesion of integument save severe bruises. Gangrene occurred, necessitating amputation below the knee.

Dr. Nardin, by *lateral lithotomy*, removed an eight ounce stone from the bladder of a young coloured man. The circumferences of the concretion were $8\frac{1}{4}$ by $9\frac{1}{2}$ inches. A good recovery ensued, in spite of symptoms of recto-urethral fistula, which gradually disappeared.

3. The present number of the *Massachusetts* publication contains a most admirable "annual discourse" by Dr. Francis Minot, brimful of good sense, modestly entitled *Hints on Ethics and Hygiene*. We had marked for quotation passages on medical education, school hygiene, and on the question of admitting women to full educational and professional privileges, but, despairing at the amount of riches, we will merely recommend the whole essay to all who can gain access to it.

Dr. Thos. Dwight has a very elaborate treatise on *The Identification of the Human Skeleton*, for which the Society awarded him a prize. A notice of this will be found on another page.

In an article on *Floating Spleen* we find some curious statements and extracts

from ancient writers. Plinius Secundus speaks disrespectfully of the organ; says it impedes the speed of the athlete in running; reports that it may be safely removed, with the sole harm of destroying the laughing proclivities of the patient; "for sure it is that intemperate laughers have always great spleens." This seems rather opposite to our common notions and expressions. Some writers even as late as the seventeenth century speak of fleetness as interfered with by the organ, and assert its occasional removal from professional runners. The paper is by Dr. Frederick C. Shattuck.

Dr. Rotch has been making experiments on the cadaver, to determine for diagnostic purposes the *area of dulness*, its exact shape, size, and limits, *caused by pericardial effusion*. Melted cocoa butter was used, by injection into the heart-sac. Of course the amount of injection was carefully noted in relation to the percussion sound. Guidance as to proper place for puncture is believed to be derived from such experiments. We are not sure whether the observer sufficiently considered the difference between dead and living organs, and between manifold conditions of life and death. Certainly he would seem to have somewhat overlooked this important matter. We would not, however, deny the great interest and value of his experiments. He considers absence of resonance in the fifth intercostal space, right side, as pathognomonic of pericardial effusion.

4. We are glad to learn from the *California Transactions* that the noble example of Harvard has borne good fruit even on the distant shores of the Pacific. The Medical Department of the State University and the Medical College of the Pacific have established a three-years' graded course of study. The report of Dr. H. S. Orme on *Medical Education* takes the highest ground, quoting the latest words of Prof. Pepper, Sir Wm. Gull, and Dr. N. S. Davis.

The experience of Dr. F. W. Hatch, as to *diphtheria*, leads him to believe that insanitary conditions may, and do, at times, originate the disease.

The grave questions concerning infant mortality, especially in asylums, are judiciously treated by the gentleman last named.

Dr. John Scott, in a paper on *Uterine Fibroids*, deprecates the frequent practice of dilating the os uteri, as often productive of constitutional irritation, leading on to destructive pyæmia or septicæmia. Simple incision, he regards as far safer, either as substitute for, or antecedent to, dilatation for removal of these tumours.

Dr. James Murphy contributes to the literature of excisional surgery several original cases of operation on the ankle-joint, with critical *résumé* of opinion on the subject, and a warm advocacy of this form of conservative surgery.

There are a number of more or less able and instructive essays and reports, needing, however, no particular comment.

5. One quite elaborate paper in the *North Carolina Transactions*, as well as a briefer one, and a discussion, indicate that diphtheria is arresting much attention there, as further north.

The retiring president, Dr. Payne, deals, in his valedictory address, with the curious and much disputed subject of *ante-natal impressions*. He contributes some new and singular cases to the already extensive literature of this subject. An instance of snake-resemblance calls to mind a very extraordinary one published several years ago in the *Journal of Insanity*, as well as Dr. Holmes's unhappy heroine in "Elsie Venner."

6. Before the *New York Society* Dr. Stephen Smith describes with enthusiastic advocacy the advantages and the practical methods of *antiseptic surgery*. A number of critical operations are given to illustrate its successful workings.

Dr. Arthur Mathewson, of the Brooklyn Eye and Ear Hospital, illustrates with four original cases the *diagnosis of intra-cranial tumours* from the ophthalmoscopic appearances of the "optic disks."

Some surgical notes by Dr. Giberson describe a *cure* (at least, temporary) *of sciatica by nerve-stretching*. The force used by the surgeon's finger, passed under the sheathed nerve, between the great trochanter and the tuberosity of the ischium, is said to have been "nearly if not quite sufficient to lift the extremity from the table." The wound did not heal kindly, being followed by unhealthy suppuration, phlebitis, and septicæmia; but the neuralgia ceased from that time, and no paralysis occurred of sense or motion. The cure, real or apparent, had endured about three and a half months.

Some notes of *operations under nitrous oxide* are furnished by the same gentleman, who evidently thinks highly of this anæsthetic. The gravest case was an arm amputation, high up. The discussion ensuing exhibited great diversity of opinions. One gentleman (we forbear to mention his name) calmly asked if there be any anæsthetic "safer and better than pure chloroform."

Dr. Bulkley has a sensible article about *Diet and Hygiene in Diseases of the Skin*.

Several papers appear in which school hygiene and the actual condition of schools are dealt with. Our readers have recently heard a good deal about this matter, so we will only say that from an account here given, some of the schools in Brooklyn have reached a lower depth of disgraceful unwholesomeness than any yet described.

Dr. Benedict reports a case in which fifteen inches of small intestine, becoming intussuscepted, sloughed and came away. Apparently the patient never fully regained her health; but, upon dying, five months later, perfect reparative union was found to have occurred, about nine inches above the cæcal valve. The calibre of the tube, however, was reduced to a quarter-inch, for two or three inches.

7. The portly volume from *New Jersey* contains three formal essays, of considerable length and merit. The first is by Dr. A. N. Dougherty, upon *glycosuria*. The writer apparently has fortunately encountered only cases of recent origin or dependent on special and temporary causes. He allows a tolerably liberal and varied diet, though insisting on a bread free from starch, and eulogizing the English article known as Camplin's flour.

The other essays are by Dr. Ryerson, upon the *rectification of abnormal presentations in labour*, and by Dr. Deshler upon the *relations of the profession to the public health*. The latter strives especially to secure legislative provision for an efficient registration of births, marriages, and deaths. And lastly, in an article on *opium inebriety*, Dr. J. B. Mattison gives some well-deserved rebukes to "domestic hypodermic medication." It is notorious, as he says, that physicians, by loose and frequent use of the syringe, suggest, if they do not absolutely commend, the idea of its discretionary employment by their patients.

In a somewhat *epidemic dysentery* which prevailed widely in one section, blistering the abdomen with cantharides almost invariably produced a free fecal discharge and great relief.

A case of *spontaneous rupture of the colon*, twelve inches above the sigmoid flexure, is reported. There was a stricture below, but no ulceration or gangrene. The patient was a man over eighty, and the catastrophe happened during sleep, at night.

Questions as to the *contagiousness of phthisis* have elicited a number of expressions in the affirmative.

Malarial diseases, with diphtheria, and, in one county, something like typho-malarial, seem to have been the diseases most noticed.   B. L. R.

ART. XLI.—*A Treatise on the Science and Practice of Midwifery.* By W. S. PLAYFAIR, M.D., F.R.C.P., *Professor of Obstetric Medicine in King's College*, etc. With notes and additions by ROBERT P. HARRIS, M.D. Second American from the second revised London edition. 8vo., pp. 639. Philadelphia: Henry C. Lea, 1878.

WE record this speedy appearance of a second edition of this work with pleasure and gratification, because it sustains and justifies the high opinion expressed of its merits two years ago. There has been a general unanimity of opinion in the profession as to the high character of Dr. Playfair's work, both as a manual for the student and a book of reference for the practitioner, and the revision and additions made to the second edition will not lower this favourable estimate of it.

A very handsome and complimentary dedication of this edition is made to Dr. T. Gaillard Thomas, and since the second edition of Barnes on Diseases of Women has just appeared with a dedication to Fordyce Barker, we must conclude that the claims of this country to consideration in the medical world are fairly and fully recognized. The compliment cannot but be as gratifying to the profession at large, as it is flattering to the individual gentlemen named who have so well earned their honors.

We should have been glad to note a change in one or two of the illustrations, and there are but one or two that are bad. The one on p. 470 presents a distinct contradiction to the text; it is said to represent the last stage of delivery of the head with the forceps, the handles turned upwards towards the abdomen, but they certainly are not turned upwards, nor could they be with the grasp the operator has of them. That this error should have been perpetuated to a second edition is most surprising.

The subject of version by the bimanual method remains as in the first edition: that is, there is no recognition of the claims of Dr. Wright of Cincinnati to priority in regard to a very considerable share of this improvement in midwifery. We have the very highest authority for saying, however, that these claims are fully recognized by Dr. Playfair, and that he has expressed regret that he was not aware of them in time to incorporate the fact in this edition. All other recognition must of course yield to that of Dr. Braxton Hicks himself, and since he has spoken upon the subject the opinions of others are of little moment. In the *Cincinnati Lancet and Clinic* of August 24, 1878, Dr. Hicks has a communication in which he fully concedes Dr. Wright's claims to priority as to a large portion of the manœuvres, while he yields none of his own as to original and independent discovery.

The additions made by Dr. Harris are of such a character as to make us wish that they were more in number and greater in extent. The description of the leading varieties of forceps of the teachers and writers of this country, with the illustrations of delivery with this instrument in the dorsal position of the patient, the only course pursued here, are of great value and interest to the student, and fill a want seriously felt in the first edition. Dr. Harris has connected his name most intimately with everything relating to the Cæsarean section in this country, and his researches have shown a result here so much more favourable than British statistics, that it cannot but influence the judgment of the profession in having recourse to this formidable operation. His additions upon this subject are therefore of great importance. An appendix upon the transfusion of milk presents all of value upon this procedure.　　　　　　　　　　　　　　　　　J. C. R.

ART. XLII.—*Cyclopædia of the Practice of Medicine.*   Edited by Dr. H. Von
ZIEMSSEN, Professor of Clinical Medicine in Munich, Bavaria.   Vol. VIII.
*Diseases of the Chylopoetic System, with Chapters relating to Diseases of the
Bladder and Urethra, and Functional Affections of the Male Genital Organs.*
By Prof. F. A. ZENKER, of Erlangen ; Prof. H. Von ZIEMSSEN, of Munich ;
Prof. F. MOSLER, of Greifswald ; Prof. N. FRIEDERICH, of Heidelberg ; Dr.
G. MERKEL, of Nürnberg ; Dr. J. BAUER, of Munich ; Prof. H. Lebert, of
Vevey ; and Dr. H. CURSCHMAN, of Berlin.   ALBERT H. BUCK, M.D.,
New York, Editor of American Edition.   8vo. pp. xiv., 935.   New York :
William Wood & Co., 1878.

THE present volume of this series contains articles on the diseases of œsophagus,
peritoneum, spleen, pancreas, and supra-renal capsules—parts of the chylopoetic
system not treated of in vol. vii., which was noticed in the July number of this
Journal for 1877.   It also contains chapters on diseases of the bladder and ure-
thra, which are generally not included in treatises on the practice of medicine.
The volume comes to us just before going to press, and we have had time there-
fore to read rather cursorily only the chapters on diseases of the spleen and pan-
creas.   Our notice of preceding volumes has been so full, and the merits of the
series is so well established, that a mere announcement of the appearance of
another volume would perhaps be sufficient.

Prof. Mosler, who is the author of the chapters on diseases of the spleen, lays
down some very good rules for the physical examination of this organ, illustrating
his remarks by a couple of diagrams which make them very much more intelli-
gible than they otherwise would be.   We know from some experience in teaching
that the determination of the size of the spleen is in many cases a task of extreme
difficulty, and the student will therefore do well to make himself thoroughly ac-
quainted with the rules which the author lays down for his guidance.

When speaking of enlargement of the spleen Prof. Mosler takes occasion to pro-
pose a plan of treatment, which he has, however, never carried out.   The favour-
able results of subcutaneous injection of tincture of iodine in glandular tumours,
especially in the thyroid gland, has led him, he says, to think that it might be
desirable to extend the same treatment to the spleen.   If a subcutaneous injec-
tion were all that he really means to recommend, there would of course be no
serious objection to it, but an injection into the gland itself might possibly excite
peritonitis, which would prove difficult to control.   The animals who were sub-
jected to this experiment, " bore," to use his own words, " this operation with-
out *intense peritonitis,*" which may possibly have been excited quite as much by
the withdrawal from the abdomen of the spleen (previously to injecting it), by a
wound in the linea alba.   He has, however, injected dilute carbolic acid into an
enlarged spleen with such favourable results that, he says, he feels further experi-
ment to be demanded.   Oddly enough, he makes no allusion, in this connection,
to hypodermic injections of ergotine, which have been used with so much success
by Prof. Da Costa[1] and others, both in this country and abroad, although he refers
to them in the treatment of rupture of the spleen.

The author also recommends the application of the cold douche to the region of
the spleen in the treatment of enlargement of that organ.   " Besides the con-
tractile influence produced," he says, " through the skin upon the elements of
the spleen, the vigorous irritation of the cold douche upon the spleen itself is to
be considered, which increases its action.   Besides this it stimulates to deeper

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[1] See number of this Journal for January, 1875.

inspirations. By the sinking of the diaphragm there is produced a pressure on the spleen, and thereby a mechanical diminution.

The chapters on diseases of the pancreas are contributed by Prof. Friedrich, who, when speaking of the anatomy and physiology of this organ, calls attention to an abnormal arrangement of the bile-duct which he has repeatedly met with, and which is not without clinical interest. Instead of descending near the head of the pancreas towards the duodenum, it occasionally goes through the head, in such a way as to be sometimes only partially, sometimes entirely surrounded by gland substance. A comparatively small enlargement of the pancreas would therefore suffice to close the duct entirely. This explains the occurrence of obstinate jaundice in cases of disease of the pancreas, in which the liver is not directly affected. The author refers also to the fact that the pancreatic juice possesses absolutely no sugar-forming power over starch during infancy. This fact, if well known, is certainly often ignored by practitioners who prescribe one or other of the various farinaceous foods for infants even before dentition is begun.

We have selected from out the contents of the volume the articles on diseases of the spleen and pancreas, simply because they are subjects which are usually very briefly considered in systematic treatises on the practice of medicine. Indeed we are unaware of the existence of any monographs which treat of them so fully as do these two articles. We have no doubt from the reputation of their authors that the other articles are of equal excellence, but we have not had time to examine them critically. **J. H. H.**

ART. XLIII.—*The Journal of Physiology.* Edited, with the Co-operation in England of Prof. A. GAMGEE, F.R.S., of Manchester; Prof. W. RUTHERFORD, F.R.S., of Edinburgh; Prof. J. B. SANDERSON, F.R.S., of London; and in America of Prof H. P. BOWDITCH, of Boston; Prof. H. N. MARTIN, of Baltimore; Prof. H. C. WOOD, of Philadelphia. By MICHAEL FOSTER, M.D., F.R.S., Trinity College, Cambridge. Vol. I., Nos. 1, 2, 3, 4, and 5. London: Macmillan & Co., 1878.

THE first number of the *Journal of Physiology* was issued last March in response to the long felt need of an English journal devoted to the interest of this science. Judging alone by the number of physiological papers formerly published in English and American journals, and more especially in the *Journal of Anatomy and Physiology*, it might have appeared that this special physiological medium was hardly called for, but the number, excellence, and variety of the papers published in the first five numbers of this new journal certainly indicate that the former dearth of material was not due to a lack of capable investigators. In fact, no better indication of the prominent position English-speaking physiologists are making for themselves could be desired than is found in the pages of this journal. Thirty original articles, in which America is fairly represented, have been published—articles occupying every branch of biological science from the "psychophysical" law of Fechner to the effects of starvation on the elimination of urea. All the articles are good, and show evidences of skilful work, while many, such as Sterling's paper on "Hyperplasia of the muscular tissue of the Lungs," Ringer and Murrell on the action of various drugs, etc. etc., will be of practical interest not only to the physiologist but to the practising physician.

Evidently English and American investigators have been stimulated to increased effort by the certainty of their views obtaining a wide and creditable circulation in the journal in whose management Dr. Foster and his distinguished co-editors

have displayed so much ability. If we will acknowledge then that the rapid increase in the number and value of English physiological investigations is due to the existence of a suitable medium for their circulation—is a true *post hoc ergo propter hoc*, then we must also acknowledge that the future of the English school of physiology lies in the hands of the general medical public, through whose liberal support alone can this worthy enterprise prosper.

Not the least valuable feature of the journal is the publication in each number of a complete list of papers of physiological interest which have appeared in the intervals of publication of the different parts, a list already occupying forty-one pages. We think, however, that its value would have been greatly enhanced by the publication not of the titles alone, but of short abstracts of each paper, such as were formerly published in the *Journal of Anatomy and Physiology*. Very often the title is but an indefinite index of the contents of a paper, and after the greatest difficulty in obtaining access to original memoirs, it is only to find that they contain nothing in reference to the point which it was desired to study. We hope that the annual reprint of this bibliography that the editors have promised will contain short abstracts of the contents as well as the titles of the physiological memoirs.   R. M. S.

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ART. XLIV.—*The Cell Doctrine; its History and Present State; for the Use of Students in Medicine and Dentistry; also, A Copious Bibliography of the Subject.* By JAMES TYSON, M.D., Professor of General Pathology and Morbid Anatomy in the University of Pennsylvania, etc. etc. Second edition, revised, corrected, and enlarged. 12mo., pp. 202. Philadelphia: Lindsay & Blakiston, 1878.

THE modern histologist recognizes the "cell" as the ultimate physical element of organization, out of which all tissues, healthy or diseased, are formed. The modern physiologist localizes all of the so-called vital phenomena in the cell, and his science can, at present, do but little more than trace out the life-history of this elementary part. The discovery of these truths, like nearly all other discoveries, has a long history. In the volume before us Dr. Tyson has traced in chronological order the growth of this cell-doctrine from the crude *partes similares* of Aristotle and Galen, through its various evolutions down to the little clump of *bioplasm*, which modern science endows with the essential life-properties of reproduction, nutrition, and development.

The first edition of Dr. Tyson's work appeared in 1870, and at once received the favourable reception from the profession to which it was entitled by its merits. The present edition shows an increase in size of about fifty pages, and almost every page furnishes evidence of careful revision.

In comparing it with the former edition, we have to mention aside from many alterations in the arrangement of the subject-matter, and the presence of several new illustrations, the addition of two new sections. The first epitomizes the doctrines of Addison, Waller, Cohnheim (1842, 1846, 1867), while the second sets forth the latest views of the structure of cells and nuclei (1877–1878), thus rendering the history complete to the date of publication.

The closing section, giving an excellent summary of the present *status* of the cell-doctrine, into which the author has incorporated his own views, has been entirely rewritten, as was necessitated by the very numerous and important contributions to the subject mentioned above.

The bibliography, highly valuable to the student who wishes to prosecute his

tudies in this department of biology, occupies forty-four pages, and contains seven hundred and thirty-four references. The list now makes up nearly one-fourth of the book, and if it grows as rapidly in subsequent editions it will almost necessitate a change of title into "Bibliography of the Cell Doctrine, with an Historical Appendix." We would suggest the use of smaller type here. The addition of an index is a great convenience in referring to the contents.

Dr. Tyson divides the evolution of the cell doctrine into three periods; these include respectively the time prior to the discovery of the compound microscope, that between this event and the observations of Schleiden and Schwann, and in the third period are grouped the results of investigations up to July, 1878.

In few departments of medicine has original work been prosecuted with as much enthusiasm as in the field of histology. Consequently we expect to find what an examination shows to be true, that the discussion of the third period of our author's division shows the greatest change over the previous edition.

Here we find briefly but clearly given the results of the recent investigations of Frommann (1867–1875), Heitzmann (1873), Strassburger (1876), Flemming (1876), Klein (1878), and others, which demand a total change in the description of the structure of the elementary part of the more complex organisms.

"Henceforward we must describe not only the nucleus but also the cellular substance (protoplasm) as fibrillar in structure, made up of a network of delicate fibres, the meshes of which are filled with an 'interfibrillar' or 'ground substance' which is structureless, and that the fibrillæ of the *intracellular* and *intranuclear* networks are continuous. And if Klein be correct we must define the *nucleoli* as merely local thickenings, natural or artificial, of the *intranuclear* network." (Page 144.)

Owing to the importance of these late observations, Dr. Tyson has appended to the volume, with explanatory text, the essential portions of the plate illustrating Dr. Klein's paper, "Observations on the Structure of Cells and Nuclei," which appeared in the *Quarterly Journal of Microscopical Science*, for July, 1878.

Although our limited space will not admit of any lengthy quotations, we venture to extract the following opinion, coming as it does from so distinguished a microscopist as Dr. Tyson:—

"In *pathological formations* all the different forms of cells here alluded to are met with, and there is now no special type of cell which is known by its shape to have a pathological impression. It is rather by the rapidity of growth of cells, their arrangement and relation to the intercellular substance, as well as peculiarities in the latter substance itself, that we know a structure to be a pathological formation. 'The cancer-cell,' which was so long an object of wonder and fear, and eagerly sought for as such, is no longer acknowledged to be anything peculiar as to form. At the same time, when cells from a suspected growth are observed to be very large, to contain numerous nuclei or centres of bioplasm, and to exhibit great variety in shape, we have evidences of that rapidity of growth which is more or less characteristic of malignant formations." (Page 148.)

In conclusion, the thanks of the profession are due to Dr. Tyson for having rendered accessible information which, until his work appeared, was scattered throughout many volumes. Since a knowledge of the cell underlies any correct understanding of physiological or pathological processes the work under notice deserves a place in the list of authorized college text-books.   W. J. C.

ART. XLV.—*A Handbook of Surgical Pathology, for the Use of Students in the Museum of St. Bartholomew's Hospital.* By W. J. WALSHAM, M.B., F.R.C.S., Demonstrator of Anatomy and Operative Surgery at St. Bartholomew's Hospital, etc. 8vo. pp. xii., 449. London: Henry Kimpton, 1878.

WE commend to our Faculties about the end of March the following from the preface to Mr. Walsham's book, and shall be happy when a similar method prevails here. "The method of conducting the pathological part of the examinations at the Royal College of Surgeons of England is to show the candidate a number of specimens of surgical affections, the morbid appearances of which he is expected to recognize, to account for, and to describe."

The book is practically to the surgical portion of St. Bartholomew's Hospital Museum what an explanatory "Guide" is to an Exhibition. No surgical topic is introduced that does not find an illustration in the museum, and yet almost every topic, certainly every one of prominence, is touched upon. Each chapter has a very brief but clear and pointed statement of the pathological process under consideration, and then the illustrative specimens are grouped, and more or less minutely described including their microscopical as well as macroscopical features if needful. For its purpose it is an excellent handbook. We should be very glad if the valuable Mütter Museum at the College of Physicians of Philadelphia had a similar handbook or guide. Practically at present it is of little use, and largely because no one knows what is in it.   W. W. K.

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ART. XLVI.—*On Asthma; its Pathology and Treatment.* By J. B. BERKART, M.D., M.R.C.P.L., Assistant Physician to the City of London Hospital for Diseases of the Chest, etc. etc. 8vo. pp. viii., 264. London: J. & A. Churchill, 1878.

WE were under the impression, before Dr. Berkart's book was placed in our hands, that it was a generally accepted fact that there are a certain number of cases of asthma which can be explained only by assuming that there exists during the paroxysms a spasmodic contraction of the bronchial tubes. Associated with this, it is true, there is generally present, either as cause or effect, some organic disease of the lungs; but, that this is not necessary, is shown by the negative results of *post-mortem* examination in the cases referred to above. The author contends, however, that the starting point of the disease is in every instance an inflammatory lesion of the lungs, and that the reason it is not always detected is the fact that our means of examination are not sufficiently delicate; adding that many cases of bronchitis, emphysema, and heart disease cannot be recognized simply by physical examination. Unquestionably no one knows better than the expert in auscultation the difficulties which occasionally embarrass the diagnosis of all these diseases, but our experience justifies us in saying that cases in which the patient daily expectorates several spittoonfuls of mucus, and in which the most practised and careful observer may fail to detect, by means of percussion and auscultation, the least trace of disease, must be very rare. We should not like, in the face of the author's confident assertion to the contrary, to say that they never occur. We certainly have never met with them, and we fancy that this will be the testimony of most *careful* (provided that they are at the same time *competent*) observers.

In the author's opinion "asthma is," therefore, "only one link in a chain of quasi-independent affections, which commences with inflammatory changes of the pulmonary tissue, and terminates with emphysema or bronchiectasis." These changes in the lungs are necessarily accompanied by destruction of the pulmonary vessels, and secondarily, in consequence of the greater amount of work which the heart is now called upon to perform, in order to force a relatively larger quantity of blood through the contracted lungs, to hypertrophy of that organ. " Under the influence of this increased pressure," the author says, "the pulmonary vessels, unprovided, as they are, with a vascular tonus, readily dilate, and, in order to compensate for the loss of the capillaries, extensive anastomoses form between the pulmonary artery, on the one hand, and the bronchial and pulmonary veins on the other, by means of vascular arches, remarkable on account of their great length, their equable diameter, and their want of branches. The surface of the bronchial mucous membrane then appears studded with granular or villous elevations. On microscopic examination these are found to be vascular papillæ, pyramidal, or club-shaped, consisting of a tortuous vessel, elevated over the surface, and surrounded with connective tissue." If we understand the author correctly, it is the liability of the lung in this condition to become congested, which gives rise to the asthmatic paroxysms. It is difficult, however, to comprehend how this affection of the lung can apparently coexist in the intervals of the paroxysms with perfect health. Take, for instance, the cases, rare indeed, but which nevertheless do occur, in which the patient only suffers from asthma after exposure to the powder of ipecacuanha, while at other times he seems to be entirely free from disease. It seems to us utterly impossible to conceive the existence in these cases of such grave lesions of the lungs.

Entertaining these views of the pathology of asthma, it is not surprising that the author explains the action of certain remedies rather differently from other observers. Ipecacuanha, tartar emetic, and lobelia, in large and nauseating doses, owe their efficacy, he believes, to their power of reducing arterial pressure, and thus of increasing serous exudation; and he explains in the same way the relief which follows the smoking of tobacco and stramonium.

The author seems to us too anxious to establish a theory of the nature of asthma different from that which is generally accepted by pathologists, and which has found favour with such distinguished physicians as Sir Thomas Watson, Hyde Salter, and Bristowe. He does not always, we think, draw the distinction between dyspnœa and asthma quite as sharply as he ought, for we find him alluding to cases of embolism of the pulmonary artery and of plastic bronchitis as if there were danger at the present time of attributing the dyspnœa which arises from these conditions to spasmodic contraction of the bronchial tubes.

J. H. H.

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ART. XLVII.—*A Practical Treatise on Diseases of the Ear, including the Anatomy of the Organ.* By D. B. ST. JOHN ROOSA, M.D., Prof. of Diseases of the Eye and Ear in University of City of New York, etc. Fourth edition. New York: Wm. Wood & Co., 1878.

WHEN the first edition of Dr. Roosa's book was noticed in this Journal in January, 1874, it was predicted that it would at once take its place as a standard authority. That it has done so and that it still maintains this position is fully shown by the present demand for a fourth edition.

The corrections that the author thought necessary, and the additions required

by the progress of otology have been made in the previous editions.   "In this edition the chapter upon Diseases of the Internal Ear has been entirely rewritten, and many additions have been made in the discussion of this subject.   The remainder of the work remains as in the last impression."   The present notice will, therefore, be confined to a few points in this chapter.

Dr. Roosa is inclined to adopt the view of Voltolini, that in many cases that pass for cerebro-spinal meningitis, the seat of the disease is really in the labyrinth. All aural surgeons meet with cases of "nervous deafness," usually in children, which are attributed by parents and family physicians to attacks of cerebro-spinal meningitis, and the question has been raised by Voltolini whether in some at least of these cases the labyrinthic affection is merely a complication of the meningitis, or is itself the primary disease.   This is an interesting point in pathology which physicians and aurists must combine to determine, as the specialist usually sees only the result of the disease.   There is great need of post-mortem reports of carefully observed cases.

There is an interesting discussion of deafness to certain tones only, double hearing, vertigo, and tinnitus, considered as symptoms of diseases of the internal ear, and of the use of electricity in the diagnosis and treatment of disease of the auditory nerve.   The author has not been able to convince himself that electricity is of any great value in the diagnosis and treatment of nervous deafness, and has finally abandoned its use.   Most practical surgeons will probably agree with him in this decision as to the present status of this agent, whatever the future may bring forth.   It has not even been decided if the acoustic phenomena produced by the galvanic current are due to direct irritation of the auditory nerve, to reflex irritation through the medium of the trigeminus, or to contraction of the small muscles of the ear, and until the whole subject has been brought to a more definite scientific basis than has yet been reached, we are perhaps scarcely in a better position to decide upon it positively and finally than was the old lady, who felt certain that electricity could not be of any use in deafness, because she had been struck by lightning and nearly killed, but it hadn't done her hearing any good.

In regard to the therapeutics of nervous deafness not very much, it must be confessed, is to be said, and the most that can be expected of an author in dealing with it is honesty, for which the reader may give Dr. Roosa full credit.   He gives some striking instances of the efficacy of treatment in syphilitic subjects, but admits that all other cases of chronic nervous deafness are utterly hopeless.   We believe, however, that no one can read this interesting chapter without feeling that in pathology, at least, the internal ear is not quite the *terra incognita* that it used to be, and that some advances have also been made towards greater certainty in diagnosis.   G. C. H.

Art. XLVIII.—*Annual Reports of the Supervising Surgeon-General of the Marine Hospital Service of the United States.* For the fiscal years 1876 and 1877. 8vo. pp. 213.   Washington, 1878.

From this *résumé* of the work performed by this most estimable service we learn that more than fifteen thousand seamen have been relieved during the year ending June 30, 1877, and a somewhat larger number the previous twelve-month. Dr. Woodworth states that no report for 1876 was printed; and therefore includes some of the matter and statistics which should properly have appeared a year ago.

The average cost of the relief afforded, per head, has been pretty steadily

diminishing—owing partly to treatment of many cases as "out-patients," whereas formerly all were taken into the hospitals—but in part also, we judge, to improved administration under Dr. Woodworth's supervision. The sum expended for each beneficiary is $24.22, against $38.41 the year before re-organization of the service, and $31.78 the year after (1871). The number of sailors aided has increased since the changes in management—though with some annual fluctuation.

In two points, at least, we find reason to believe that financial economy has not been attained at the expense of humanity ; out-patient relief is sought early, by patients who would long and harmfully delay entrance into hospital, which was formerly their only resource ; and provision is now made for paying the passage home of foreign sailors who desire to die, or take their chances of recovery, in their own land. It is obvious that both the out-patient and the home-transportation methods may be, when intelligently and humanely administered, as much a kindness to the sailor as a saving to the government. Apart from the natural desire of men to die amid their kindred, no one doubts that the removal of nostalgia often makes all the difference between continued invalidism and recovery.

We find here again urged—"precept upon precept, and line upon line"—the importance of an official medical inspection of all men offering themselves as seamen. Surely, when we consider the conditions attending marine life and investments—how many lives and how much property depend on the absolute efficiency of each man in his place, and the impossibility of replacing the incapable in time of danger—we ought to support Dr. Woodworth and his staff in the effort to make it a matter of course and of certainty that a sea-going crew are all that they profess to be, and not practically twenty or fifty per cent. short of their nominal and required force. And the Marine Hospital Service itself, and the able-bodied sailors who contribute to it a percentage of their hard-earned wages, have also a right to protection against the quartering upon their funds of men who never were fit for duty, or who have undertaken maritime functions after becoming disabled by age or disease.

With regard to this same matter of insuring seaworthiness of men as well as ships, Dr. Bailhache supports his Chief, in a paper in which British and other testimony strongly advocates inspection of sailors as well as timbers. He believes ten per cent. to be a small estimate of the loss of life by maritime casualties, due to physical disability of seamen ; and thinks the proportion of pecuniary loss due to the same cause about twice as great.

Medical Purveyor and Chief Clerk Oscar Oldberg contributes an article favouring the metric system of weights and measures for all medical and pharmacal purposes. In writing prescriptions, he advises, as a precaution against mistakes, during the "transition period," the use of Arabic numerals *before* the unit of measure, instead of (as ordinarily now) Roman figures *after* the measure ; *e. g.*, "Ext. Coloc. Cp. 6 Gm.," instead of "Ext. Coloc. Cp. ℥iss." The change of numeral, and the underscoring of the "grammes," would, he believes, prevent mistaking grains for grammes. It is also suggested as a simpler method in prescribing to use decimal parts of a "gramme," rather than entire "centigrammes" —as "0.10 Gm," in place of "10 centigrammes."

As to diseases treated by the Service, we find, per thousand cases, "ague," 150+ ; remittent fever, 58+ ; rheumatism, 118 ; syphilis, 181 ; bronchitis, 42+ ; pneumonia, 23 ; and diarrhœa and dysentery together, about 62. Phthisis appears only as 27+ ; with pleuritic troubles, 11.

Surgeon Wyman has an instructive paper upon the exposures and resulting diseases connected with the peculiar circumstances of firemen and "roustabouts" on the river steamboats of the South and West. The desire to save time, we are told, leads to the sending of men into boilers while so hot and moist as frequently

to cause syncope. In some cases these exposures seem as wanton and needless as they are inhuman. Many of the persons employed are ignorant negroes, towards whom their employers appear to feel no sort of concern or sense of duty.

Several papers deal with particular epidemics of *yellow fever*, observed by the writers. Dr. Stone saw the disease in Savannah in 1876. Entertaining at first the fullest belief in the uniform exotic origin of this malady, he soon arrived at strong convictions as to the potency and sufficiency of local causes. Certain cases he attributed solely to sewer-poisoning. Of course he also holds decided views as to the preventibility of the disease by sanitary means. If we accept his statements, the conditions as to water-supply, sewerage, and soil-saturation, were certainly very bad at the time.

Ass't Surg. Henry Smith, observing the same epidemic, a little later in the summer, lays little stress on local causes. The spread of the disease he is disposed to attribute to fomites, but not to contagion from person to person. He believed he could trace the extension of this epidemic, at the rate of about forty feet per day, independently of the winds, and as if creeping along the surface of the ground. The temperature of the early summer had been high, and the rainfall excessive. Unlike Ass't Surg. Stone, Dr. Smith holds strongly to the theory of importation—admitting bad sanitary surroundings simply as favouring the spread of the disease.

Reporting concerning yellow fever the following summer in Fernandina, Surgeon Murray states that about three-fourths the whites and half the coloured people were attacked. The mortality in this little town seems to have been strangely low: of 85 African patients not one died. Dr. Murray places great reliance upon quinia and cinchonidia.

In all the papers much stress is laid on the evil influence of filth and bad drainage, on the unusual susceptibility of the coloured people, and on the malarial character or affiliations of the disease, as thus witnessed in these recent epidemics.

<div align="right">B. L. R.</div>

ART. XLIX.—*Suicide not Evidence of Insanity*. By Hon. O. H. PALMER, of New York. Published by the Mutual Life Insurance Company of New York.

THIS pamphlet of forty pages combats what the author assumes to be a popular error. We are inclined to believe that the tendency, which undoubtedly exists, to give verdicts against insurance companies, is not so much due to any definite belief, as implied in the title of this essay, as to a certain false sentimentalism whose manifestations are daily illustrating the beauties and excellences of jury trials. It is not, we fear, that an average dozen "good men and true" suffer under an error of judgment, as to the relations of suicide to mental soundness, so much as that they catch at any pretext to transfer money from the pocket of an (assumed) "rich corporation" to that of a bereaved and destitute family. Something in the spirit of our times, or in the influences of our institutions, renders the jury conscience very callous to the appeals of abstract right and justice, while very tender to the claims and feelings of individuals or families who are in trouble, without much regard to questions of right and wrong. The judge may expound the law till he is black in the face, but the jury calmly render a verdict according to their impression of what is "about right," with the sublimest disregard for his teachings.

Assuming the general prevalence in America of the belief that suicide is evidence of insanity, Mr. Palmer combats it by citing the habits and customs of

ancient people, and of Oriental nations at present, among whom suicide was and is as far from indicating insanity as is embezzlement in our more favoured age and country. Possibly he is in error in using this argument, since it is probably the especial doctrines and beliefs of Christianity and of modern civilization that render suicide so abhorrent to the mind as to suggest the idea that only the de-throned intellect can adopt it.

Portions of our author's argument are, however, certainly cogent and univer-sally applicable. Some of the finest minds that have adorned European litera-ture in recent times have coolly argued in favour of the right of each man to cut the thread of life whenever existence becomes burdensome. Had they acted on their theory, we doubt if many would have deemed them necessarily insane. The principle of self-sacrifice, too, for country, for loved ones, and for ideas, has not been limited to pagan times and countries. Severe and hopeless suffering, too, seems to us a cause of suicide not necessarily implying madness. With our writer, we are unable to see *presumptive* evidence of lunacy in the suicide of a man who, knowing he must otherwise witness the poverty of his family, or leave them to meet its trials alone, has arranged his life insurance in their favour, and then sought death. Several of the most remarkable cases on record where at-tempts of this character are believed to have been made, are here very graphi-cally described.

But whatever may be our speculative views as to suicide, it seems to us very unreasonable, in a matter like life insurance, where there are conditions explicitly stated on both sides, to allow a jury coolly to render of no effect an express stipu-lation, voluntarily assented to by both parties, in order to assist a destitute family at the expense of a company. Why is not the condition as to suicide just as worthy to be enforced as that against foreign travel, dangerous employments, etc.?

It is, perhaps, a not unnatural error, in writing from the life insurance point of view; but we cannot but feel that Mr. Palmer makes a great mistake in inter-preting general belief by the action of juries. With that exception, the pamphlet is able and well written.   B. L. R.

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ART. L.—*Fifth Annual Report of the Secretary of the State Board of Health of the State of Michigan.* For the fiscal year ending Sept. 30, 1877. 8vo., pp. lxxviii., 503. Lansing, 1878.

THERE are a few points in regard to which the Michigan Board need fear no comparisons. Its managers seem to have remarkable tact and facility in so de-vising and constructing forms and circulars as to reduce to an almost incredible minimum the labour of responding to the inquiries thus made. So cunningly and admirably are their blanks arranged that the busiest or the idlest clerk or physician can hardly plead lack of time as excuse for not filling them. Another matter in which the Board excel, is the preparation of brief tracts for circulation among the people. It may not be very dignified, from a purely literary point of view, to sprinkle one's pages with italics, two or three sizes of capitals, and dozens of catch-words. But to attract the popular attention, to enlighten the popular mind, and to im-press upon the popular memory certain all-important facts and principles, the methods here used are admirably adapted. As formal essays for the benefit of sanitarians, the Michigan Health papers may not be quite up to the standard of those of the Massachusetts Board; but as teaching for the people they seem to us

fully as effective.   For an illustration we may refer to the capital papers on the treatment of persons nearly drowned.   The clearest and most concise instructions have been printed, on broad sheets, on neat cards, and as pamphlets, and circulated in the most thorough and ingenious manner.   In this Report the special aim is to impress the truth that immediate and even rough treatment directed towards clearing the vital organs from water, and the re-establishment of respiration, should forestall coddling.   The points are well made, in a way to impress plain people.   As an illustration of the necessity of perseverance in attempts to restore respiration, a case is here given where some *six hours* of persistent effort elapsed before " decisive signs of life appeared," and yet recovery was complete. The directions now given, aiming at the economy of precious time, are circulated in the same way as former instructions.   Every policeman will see at a glance not only *how* to restore respiration, but the proper order of steps towards the desired end.

Another direction in which the Board has been doing good work, is in the inspection of kerosene oils, and obtaining a law positively prohibiting the use or sale of an article below a certain standard.   The almost entire disappearance of the lamp-disasters from the accident lists of the State, attests the efficiency of the efforts made.   And moreover, the producers and dealers in kerosene have actually petitioned the Legislature for a removal of the restrictions which have prevented them from murdering the former and legitimate quota—so that the Board is obliged to make a counter-appeal to avoid a return to the good old murderous ways.   One lot of oil, marked " Inspected and Approved : Michigan Legal Test, 150°," was suspected by the State inspector, who found that it flashed at 76°; in other words, was about as safe as gunpowder with a lighted candle in it.   One can easily believe that this one seizure saved many lives.   Experiments have convinced the Board that it is by no means necessary that the body of oil in the lamp be raised to the test temperature, in order to become dangerous.   If any metallic portion of the lamp reaches a high degree, it may vapourize the fluid in contact, and this, if mixed with air, becomes an explosive compound.   It was found this dangerous heating of the metal part was almost sure to occur upon the removal of the chimney, and liable to follow the turning down of the flame.   In one case, after taking off the chimney the collar of the lamp rose in ten minutes from 102° to 163°, while after the resulting explosion the oil was only 80°.   The lamp and wick were new and well filled.

Among the more formal essays is an excellent one on Recreations, by the Rev. Chas. H. Brigham.   Dr. Lyster, writing upon Healthful Dwellings, has added to his essay a mass of information as to the homes of the people all over the State.

We learn that during the fiscal year Detroit had 278 cases and 133 deaths from smallpox.

In the diseases prevalent during the year we notice a somewhat remarkable proportion of cases in which typhoid fever is attributed to filth-poisoning, especially in the drinking water, through proximity of wells and privies.   A good deal of diphtheria is reported, in apparent relation with the same causes.   The occurrence of a case of smallpox in Ypsilanti leads the reporter to remark that this and former cases have been traceable to the foreign rags imported from abroad in bales, and here opened and picked over for use in the paper-mills.

Dr. Lee reports having attended through an attack of erysipelas a half-breed Canadian-Indian midwife, whom he found to have imparted, as soon as she was able after recovery, puerperal fever to five women.   He was fortunately able to prevent a continuance of her pestilential labours.

To letters of inquiry concerning diphtheria, which here, as elsewhere, has forced itself into an unhappy prominence, forty-eight answers were received. These form a valuable contribution to our knowledge of the disease, though they are not as yet collated. Nearly all reports mention either polluted wells, foul and wet cellars, no cellars at all, or that the patients lived on the lower story. Often more than one of these conditions were present. It occurs to us, however, that many of the country houses may have only one story, which would add to the apparent, and perhaps the real, influence of this condition.

A still larger number of correspondents deal with scarlet fever, as observed in their neighbourhood. Twenty-nine reporters have met cases in persons over fourteen years of age. In one instance the patient was sixty-five. The average of "greatest age," as reported, is twenty-nine.

Dr. Worsfold suggests means for avoiding the terrible accidents which so frequently occur near our railway centres, from men catching their feet in the angles of the "frogs" and "guard-rails," which form a part of every railway switch. We read only recently of a case in West Philadelphia, where a man was thus caught, and held long enough to be shockingly mangled by the approaching locomotive. A wooden filling, to be so bevelled as to be wider open at top than at bottom, is here described as an efficient and safe device. The suggestion of a possible slight danger of causing the wheels to leave the track is met by the true statement that where some such invention is most needed, in dépôts and caryards, the speed is too low to cause any risk of leaving the metals. And at points where switches are passed at high speed there is no such number or confusion of trains as to endanger the switch-tender's life, or require such appliances. It is in the making up of trains, and the delicate and rapid manœuvres required to send different arriving cars upon different tracks, that the accidents happen.

<div style="text-align: right">B. L. R.</div>

Art. LI.—*Handbook of the Practice of Medicine.* By M. Charteris, M.D., Professor of Practice of Medicine, Anderson's College, Glasgow. With illustrations. 12mo., pp. 336. Philadelphia: Lindsay & Blakiston, 1878.

The author of this little book has endeavoured to condense into a duodecimo volume of about 300 pages what Ziemssen has found it impossible to include in the fifteen large octavos in which he at first proposed to issue his work on the Practice of Medicine. If it may be urged against the latter work that many of the articles in it are of unnecessary length and would bear without injury a little judicious pruning, they are at least thoroughly instructive; while, on the other hand, nothing but the most superficial idea of the nature and treatment of disease can be gained from the former. We have looked carefully through it and have found little in it either to praise or to condemn utterly. It is a good representative of its class —as good as any other we know of—but the class is very objectionable, because it has the tendency, we think, to promote laziness in the student and superficiality in the practitioner. Such books seem, however, to command a ready sale, and as long as this is the case we fear they will continue to be written and published.

<div style="text-align: right">J. H. H.</div>

QUARTERLY SUMMARY

IMPROVEMENTS AND DISCOVERIES

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

Case of Absence of the Inter-auricular Septum, without Cyanosis, in a Man aged Forty.

Dr. RICHARD CATON, in the *Lancet*, August, 1878, p. 252, reports an interesting case illustrating the truth of Stille's observations that complete admixture of arterial and venous blood may take place without cyanosis being present. Many cases have been reported (*vide Medical Digest*, section 763–4), Dr. Caton justly remarks, where, with a large open foramen ovale, no cyanosis existed; but in this case, with greatly dilated auricles, an aperture existed measuring at least three inches in all directions.

August L., a powerfully built muscular man who had had good health all his life, and had been twenty years at sea, was admitted into the Liverpool Northern Hospital on December 10, 1877, suffering from dyspnœa, œdema of the legs, and ascites. Three months previously he had a similar attack. On admission the patient was somewhat cyanosed, and had much cough and expectoration. Pulse 50, intermittent, unequal; temperature, 100°; arteries rigid; cardiac dulness greatly enlarged; sounds normal; veins of the left side of the neck dilated and pulsating, synchronously with cardiac diastole, and filling from below; lungs resonant; expiration prolonged; crepitation at both bases, and *râles* nearly all over; stomach and bowels healthy; urine pale, acid, sp. gr. 1007, no albumen. Rest and milk diet quickly relieved all the symptoms. Towards the close of December he had a relapse, which quickly passed away, and he left the hospital on the 18th of January, 1878, intending to return to work. On the 29th of the month he returned much cyanosed, with great dyspnœa, the lungs being full of crepitant *râles*. On the next day, he fell dead while attempting to get out of bed. A *post-mortem* examination showed the pericardium to be generally adherent; the ventricles, auricles, and appendices were greatly dilated. The pulmonary artery was unusually large, and so were its branches throughout. All the valves were healthy. No communication existed between the aorta and the pulmonary artery. There was no partition between the auricles; a disk of cardboard, three inches in diameter, just fitted the orifice.—*London Med. Record*, Oct. 15, 1878.

Absence of the Quadratus Femoris.

Professor WENZEL GRUBER, of St. Petersburg (Virchow's *Archiv für Path Anat. und Phys.*, Band xxxvii, Heft 3, s. 346, 1878), records the absence of the quadratus femoris muscle in eleven thighs of eight corpses of both sexes. Out of these it was absent thrice on both sides—twice in males, and once in a female subject—and was more often wanting on the left than on the right side. With the absence of the muscle, there was associated in every eleventh case either absence of the gemellus inferior or of both the gemelli; and in one out of five subjects in which this muscle was absent in one thigh, the fellow muscle of the other thigh was abnormally small. In only one thigh, moreover, has Professor Gruber seen a really rudimentary quadratus femoris. In order, finally, to show that Hallet was erroneous in terming the absence of this muscle in man as "Thierbildung," he asserts that there is no mammal as yet known in which the muscle is constantly absent.

[The above cases appear to point to an opposite conclusion to that which has hitherto been arrived at. Meckel (*Handbuch der Mensch. Anat.*, Bd. ii, s. 552, Halle, 1816), records a case in which, while the muscle in question was absent, the gemelli were unusually strong. With the only instance in which Hallet (*Edin. Med. and Surg. Journ.*, vol. lxix, p. 20, 1848), found the quadratus femoris deficient, out of 105 subjects, there was also an unusual development of the two gemelli and the obturator internus. Theile, too, in the *Encyclopédie Anatomique* (tome iii, p. 279, Paris, 1843), notices the occasional absence of the quadratus femoris in man, and observes that "alors les jumeaux ont plus de volume." In the *Journ. of Anat. and Phys.* (vol. ix, p. 185), Bellamy records the absence of this muscle on both sides in a female. With this was associated a great and evidently compensatory development of the obturator internus and both gemelli. In a Cape ant-eater, *Orycteropus*, dissected by the reporter, while the quadratus femoris was absent, the gemelli were well developed (*Trans. of Linn. Society*, vol. xxvi, p. 589). Conversely, in a species of Armadillo, *Dasypus sexcinctus*, also dissected by the reporter, this muscle was in a good state of development, but the obturator internus was absent, and the gemelli very small (*Ibid.*, p. 551). Dr. Murie, in his monograph upon the Three-banded Armadillo, *Tolypeutes conurus* (*op. cit.*, vol. xxx, p. 96), states that while there was only "a pair of feeble gemelli," a "longish goodly sized" quadratus femoris was present. *Rep.*]—*London Med. Record*, Oct. 15, 1878.

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Innervation of the Uterus and of its Vessels.

A communication is made in the *Wiener Med. Jahrbucher* by v. BASCH and HOFMANN, giving the results of numerous experiments they have performed on dogs. They find that the uterus receives its motor fibres from two sources. On the one hand, from the hypogastric nerves proceeding from the posterior mesenteric ganglion; and, secondly, from nerve-fibres issuing from the sacral plexus. It is well known that Spiegelberg denied any motor power to the hypogastric branches, and Frankenhäuser considered that the sacral branches were destitute of motor power. Now, according to the remarks of v. Basch and Hofmann, a very distinct antagonism exists between these two sets of nerves. If the hypogastric branches be electrically stimulated, contraction of the circular fibres of the uterus takes place, the cervix descends into the vagina, whilst the os opens. On the other hand, on stimulation of the sacral nerves the longitudinal fibres are made to contract, the uterus becomes shorter, and the os remains closed. Suppression of respiration, or stimulation of the sciatic nerve, acts in a reflex manner,

chiefly on the hypogastric nerves. Their experiments further showed that the vessels of the uterus obtain their nerves from the same sources as the muscular tissue, the nervi hypogastrici supplying the constricting and the sacral nerves the dilating fibres, which can likewise be brought into action reflectorially through the sciatics.—*Lancet*, Nov. 16, 1878.

MATERIA MEDICA AND THERAPEUTICS.

The Action of Arsenic.

The action of arsenic is a subject for investigation of much importance. Its therapeutic value is so well established as to render it one of the most reliable agents we possess for effecting certain objects. Indications are not wanting that the range of its therapeutical employment may be considerably extended, and there is reason to hope that a more accurate study of its physiological action may render its use more precise in those diseases in which it sometimes does good, but more often fails.

A series of papers have been lately published in *Virchow's Archiv*, which contain an account of an elaborate research into some particulars of its action by Dr. A. LESSER, of Berlin. The first point investigated is its action on the heart of the frog. It is known that the effect of a large dose of arsenic is to retard the action of the heart, and to finally arrest it in diastole. Although the frog lives on for some ten minutes, no stimulus will reawaken the cardiac contraction, even though the heart is excised. Sklarek found nevertheless that the irritability of the muscular tissue of the heart persists, and hence he concluded that the arsenic acts by paralyzing the motor ganglia of the heart. Lesser has observed that the form of the cardiac contraction is changed by the arsenic ; the contraction of the ventricle becomes irregular, so that it undergoes peculiar changes of form during its systole. The interval between the contraction of the auricles and of the ventricles becomes unequal, and ultimately that of the auricles ceases long before that of the ventricles. Almost to the last a slight touch on the auricle at the opening of the sinus will provoke a local contraction, and a stronger stimulation one of the whole heart. Hence Lesser infers that the ganglia of Remak lose their irritability before the ganglia of Bidder. This conclusion was in part corroborated by a further series of observations on the isolated ganglia regions, which showed further that the paralysis of the ganglia of Remak is preceded by a transient increase in their irritability, the result of which is, if the heart is separated from the central nervous system, to cause an initial increase in the frequency of its contractions. When its central connections are undisturbed, this increase is not observed, in consequence of the arsenic causing a simultaneous stimulation of the vagus, by which the effect on the ganglia is counteracted. An increase in the frequency of the heart's action has been noted in man as an effect of small doses of arsenic ; but doubt has been raised whether it is not of merely psychical origin. This increased frequency of the pulse was, however, found by Lesser to be a constant effect in warm-blooded animals of the intravenous injection of small doses, and he found further that the acceleration is not accompanied by any noteworthy increase in the arterial blood-pressure. Medium doses cause first an increase, and then a decrease in the heart's action, while large doses decrease it from the first. In the latter case the pressure in the aortic system falls immediately, and the more rapidly the larger the dose. If arsenic is injected

subcutaneously the increased frequency of the pulse is a regular though very brief consequence, but otherwise the phenomena agree perfectly with those which follow the injection of arsenic into a vein. The increased frequency of the pulse is found to be the result of two conditions—a diminution of the tonic action of the vagus, and an augmentation of the action of the cardiac ganglia. The diminution in the frequency of the heart's action which is produced by larger doses is due to a depression of the action of the cardiac ganglia, and in some cases an increase in the tonic action of the vagus. In some animals, as in the frog, it was found that the muscular tissue of the heart does not lose its irritability. That of the ends of the vagus in the heart, tested by the electrical stimulation of the trunk of the vagus, is first increased by the action of the arsenic, then is lowered, and finally extinguished. On the other hand, the action of the accelerator nerves of the heart is in no way affected by the arsenic. Nor can any effect be ordinarily traced upon the centre for the vaso-motor nerves, upon those nerves themselves, or upon the muscular tissue of the vessels. For the stimulation of the vaso-motor centre an amount of arsenic is necessary which cannot reach it when the arsenic is injected into a vein; it is necessary to inject it directly into the carotid artery. Even then, however, stimulation of the centre is the only effect; paralysis can never be obtained.

A very marked effect on the adjacent respiratory centre was also observed to be produced by arsenic. It appears to be due in part to the direct action of arsenic upon the centre, and in part to the stimulation by it of the ends of the vagus in the lungs. The direct effect upon the centre is demonstrated by the fact that it is to be observed even after section of the trunks of the vagi; and the effect on the pneumogastric in the lungs is proved by the fact that when these nerves are intact the effect on the respiration is greater than when they are divided. Larger quantities of arsenic extinguish the irritability of the respiratory centre, but less rapidly when the vagi are intact than when they have been previously divided. The initial increase in the respiration is not very great, for the respiratory movements, although increased in frequency, are diminished in extent. A very interesting experiment corroborates the direct action of arsenic upon the centre. A certain strength of the induced current applied to the central end of the right vagus of a rabbit produced constantly a certain acceleration of respiration, never an arrest. Some minutes after the subcutaneous injection of fifteen milligrammes of arsenic per kilogramme of weight of the animal, precisely the same stimulation of the vagus caused an arrest of the respiratory movements, due to tetanus of the inspiratory muscles. Forty minutes later, when the second stage of poisoning had set in, the same mode of stimulation with a much stronger current failed to produce the effect. If the same quantity of arsenious acid is brought into relation with the nerve-centres more rapidly than by the method of subcutaneous injection, the effect is more intense, and of a paralyzing rather than a stimulating character. The diminished action of the respiratory centre occurs immediately after the introduction of the arsenic. The objection may, however, be raised to these experiments that the disturbance of respiration is possibly the consequence of changes in the gaseous contents of the blood, resulting from the retardation of the heart's action and of the movement of the blood. But if the carotid on one side and the jugular on the other be opened immediately after the effects of the poisoning by arsenic are manifest, it will be seen that there is still a marked difference in the colour of the arterial and venous blood; and this, in conjunction with the fact that the heart continues to act strongly for some minutes after the respiratory movements have ceased—as evidenced by a needle through the wall of the thorax, or a manometer introduced into the carotid artery, seems effectually to meet the objection. Hence, although arsenic certainly kills cold-

blooded animals by its action on the heart, it does not, as Sklarek thought, kill warm-blooded animals in the same way, the heart being in them the *ultimum moriens*.

The effect upon the temperature was carefully observed in these experiments. It was found to present a remarkable depression, proportioned in degree to the duration of the intoxication. In one experiment, which lasted 230 minutes, the fall was from 38.7° to 28.9° Centigrade; in another, lasting 130 minutes, it was from 38.5° to 31.2°; and in a third, lasting 52 minutes, from 39.9° to 36.3°. The fall was more rapid in the first half of the poisoning than in the second. The amount of the arsenic administered had little influence on the rapidity or degree of the depression.

The action of arsenic on the intestinal canal is of considerable importance, on account of the special effect which is produced on these organs in acute poisoning. Peristaltic action is increased, and even a tetanic contraction of certain parts of the intestinal wall, in consequence of the irritation of the ganglia contained in the wall; for either or both of these phenomena may be produced by the local action upon isolated portions of the intestine. The effect occurs immediately after the injection of the poison, and long before any influence on the heart or respiration is produced, and cannot, therefore, be ascribed to the diminution in the amount of oxygen in the blood. Neither section of the vagus nor of the splanchnic nerves has any influence on the result.

Besides this effect on the muscular coat, gastro-enteritis is, as is well known, a constant phenomenon of poisoning by arsenic. Böhm and Unterberger asserted that on this account arsenic is more poisonous when administered by the mouth than when injected into a vein; that the smallest fatal dose by the mouth is not fatal if injected. Lesser is unable to confirm this conclusion. He found it most lethal by injection, as are most poisons. The croupous membrane, which is often present in the stomach and small intestine, was only found when arsenic in the form of powder was given, never when a solution was employed. The false membrane always contains large quantities of crystals of arsenic, whereas they are few or absent in that part of the mucous membrane which is the seat of a simple catarrhal inflammation. Doubt has been thrown by recent observers upon the old opinion that arsenic in the blood is excreted by the intestinal mucous membrane, but this view is confirmed by Lesser, who has found that an appreciable quantity can be extracted from the contents of the alimentary canal, although one which bears a very small proportion to the amount injected, and not enough to account for the inflammation which is found, and which must be due also to the presence of the poison in the vessels and lymphatics of the intestinal wall.

Another point examined by Lesser is the influence of arsenic on the irritability of the striated muscular fibres and of the cerebro-spinal nerves. The method of investigation was by observing the minimum strength of the current required to excite the divided gastrocnemius in two frogs, one poisoned by arsenic, the other unpoisoned. It was found that the arsenic caused a rapid diminution in the nerve irritability, and the fall is greater during the first than during the second half of the toxic period. The effect is not confined to the nerve-trunk, for other experiments seem to show that there is a similar and still more rapid action upon the termination of the nerves in the muscles. From other experiments Lesser infers that the irritability of the muscular fibres themselves is lowered by the poison in just the same manner as that of the nerve, but he does not appear in these to have excluded with sufficient care the possible participation of the intramuscular nerve-filaments. Investigations on the influence of arsenic on the sensitive nerves, and their terminations in the spinal cord, show that immediately

after the injection there is a brief increase in reflex irritability, somewhat later a diminution, and, finally, a disappearance after the arrest of the heart's action. These effects are produced by a direct action on the spinal cord, since they appear at the same time in a leg which is exposed to the action of the poison as in one which is excluded from the action by ligature of the artery.—*Lancet*, Nov. 9, 1878.

Hypnotic Action of Sodium Lactate.

W. VON BÖTTCHER (*Berliner Klin. Wochenschrift*, 1877, No. 37) states that the effects of lactic acid as an hypnotic were tried upon 60 cases. The dose of the sodium salt varied from 8 to 15 cubic centimetres. Of these 60 cases, 39 gave negative, whilst 21 gave positive results. In 7 of the 21 positive cases, the effect of the lactic acid was to give sound sleep after an hour's interval ; in 9 cases the ordinary sleep became deeper, whilst in others again there was an abnormal feeling of fatigue. The action was relatively more certain in young females when administered upon an empty stomach, and in the evening. There was no period of excitation before the advent of sleep, but the after effects upon the digestion were most unpleasant. Lactic acid is, therefore, to be considered as an untrustworthy hypnotic.—*Lond. Med. Record*, Oct. 15, 1878.

Anæsthetic Properties and Mode of Elimination of Iodide of Ethyl.

M. RABUTEAU, in a note read before the Société de Biologie (*Gazette Médicale de Paris*, October 12, 1878), discusses the anæsthetic properties and mode of elimination of iodide of ethyl. This, the ordinary hydriodic ether, is a colourless liquid of a pleasant ethereal smell, with a piquant taste, which, however, is not caustic, as in the case of chloroform ; its density is 1.946. It is readily soluble in alcohol, and in ether, but only very slightly so in water. Mingled with water it falls to the bottom, dissolving so far as to impart its taste and smell to the mixture. It volatilizes readily at the ordinary temperature, producing cold. It boils at 72.2° C. (161.96° Fahr.), but is not inflammable. Iodide of ethyl is rapidly altered by light, becoming brown from liberation of iodine, but it may be again made colourless by shaking it with water which has been rendered feebly alkaline, and afterwards washing with pure water. It is slowly decomposed by the alkalies, and by the oxide and salts of silver. Iodide of ethyl is therefore an unstable ether. The body is formed by the action of hydriodic acid upon ethylalcohol, iodide of ethyl and water being formed. Experiments with fowls, frogs, and plants show that iodide of ethyl is an anæsthetic which acts more slowly than bromide of ethyl and chloroform, that its effects are more persistent, that it is broken up in the organism into an iodide which is probably the iodide of sodium, that it is found in the saliva and urine, and that, like bromide of ethyl, chloroform, and ordinary ether, it prevents germination.—*Lond. Med. Record*, Nov. 15, 1878.

Pelletiérine.

M. DUJARDIN-BEAUMETZ, at the meeting of the Société de Thérapeutique on June 26th (*Gazette Hebdomadaire*), read a paper on the action of " pelletiérine" when used as an anthelmintic. He showed a tænia which had been expelled after the use of this new alkaloid, which was discovered by Tauret (of Troyes). The dose administered was 57 centigrammes (eight grains) of " pelletiérine" in 300 grammes of water. In about a quarter of an hour headache and faintness were experienced by the patient ; after two hours he took a dose of castor oil, and in the course of the day an entire tænia was passed. Similar results

have been obtained by M. Mollé (of Troyes) and Garnier (of Mans); but MM. Laboulbène and G. Paul did not find it so satisfactory; they, however, only gave from 25 to 30 centigrammes. There is no doubt that it is a powerful anthelmintic; it should be used along with the compound tincture of jalap and the syrup of senna.—*London Med. Record*, Dec. 15, 1878.

The Medicinal Uses of Iodoform.

The numbers of the *Wiener Medizinische Wochenschrift*, 24 to 28 inclusive (1878), contain interesting papers on this subject by Professor MOLESCHOTT, of Turin, Dr. MRACEK, clinical assistant to Professor Sigmund at Vienna, and Professor ZEISSL, of Vienna. Professor Moleschott's paper will be found in full in the current number of the MONTHLY ABSTRACT (page 4).

Dr. Mracek briefly reports the result of the external use of iodoform in Sigmund's clinic during the early part of 1878. It was applied in one of the following forms: One part iodoform to (*a*) 1 of rectified spirit, and 5 of glycerine; (*b*) 3 to 4 parts powdered white sugar; (*c*) 5 parts vaseline; or as collodion (1-10 or 1-15). A small brush was used to spread them; cotton-wool was then laid over the part, and fixed with plaster. The dressing stayed unchanged for from twelve to twenty-four hours. Syphilitic ulcers, hard chancres, swollen inguinal glands, and ulcerating gummata were treated with success. The iodoform causes next to no pain; the sores acquire a clean surface in twenty-four to forty-eight hours, in three to four days granulations are rapidly growing, and within a week cicatrization has set in with remarkable vigour. The antiseptic effect of the iodoform checks all smell from gangrenous sores; and lastly, iodoform does not permanently stain the clothes. Compared with lotions of carbolic acid, salicylic acid, chloral, and astringent preparations of iron, etc., in precisely similar cases, iodoform carries off the palm.

Professor Zeissl especially recommends iodoform as an internal remedy in syphilitic neuralgia, and describes two cases which, resisting all other remedies, yielded only to iodoform. In suppurating glands, with or without sinuses, he is averse to the local application of iodoform for more than a few days; but in torpid ulcers, whether specific or not, he speaks most warmly of its value.—*Med. Times and Gaz.*, Nov. 30, 1878.

Effect of Bicarbonate of Potash on the Acidity of Urine.

Dr. C. H. RALFE, Teacher of Physiological Chemistry in the Medical School, St. George's Hospital, has made some observations (*Lancet*, Nov. 9, 1878) to test the effect of bicarbonate of potash on the reaction of the urine when taken before and when taken after meals.

He found that the effect of bicarbonate of potash, taken after food, on the acidity of the urine, is different from that when it is administered before meals.

For when taken on an empty stomach the acidity on the day of administration was only slightly depressed, whilst on the day following the acidity was considerably higher than it was the day before the salt was taken. But when it was administered during the process of digestion the acidity of the urine entirely disappeared, being on two occasions neutral, and on one alkaline, whilst on the succeeding days there was no marked increase in the acidity of the urine as compared with that of the days preceding the experiment. And the same difference is observable in the hourly variations of the urine, for when the bicarbonate was taken before meals the effect of the alkali passed off at the end of two hours, and the amount of acid passed in the succeeding three hours was nearly equal to what was passed on the day no medicine was taken; whilst when the salt was taken

after meals the urine remained alkaline up to the end of four hours after the dose was taken, and no recovery of acidity was noticeable.

The result of these observations tends to establish the fact that the administration of an alkaline bicarbonate on an empty stomach increases the acidity of the system, whilst its administration after a meal diminishes it.

Dr. Ralfe finds the explanation of this in that the acid reaction of the urine is generally considered due to the decomposition that occurs between an acid or an acid salt and the neutral phosphate of sodium in the blood, acid sodium phosphate being formed, which passes out with the urine. Now, one of the chief acid salts in the blood is undoubtedly bicarbonate of potash or soda, an acid salt with an alkaline reaction. It is, therefore, not surprising to find the administration of an acid salt, if it passes unaltered from the stomach into the blood, causing an increase in the acidity of the urine. And this is, indeed, what happens when a dose of bicarbonate of potash and soda is taken into the stomach before meals, for then, the mucous membrane under normal conditions being either neutral or alkaline, the bicarbonate is absorbed undecomposed into the blood, and causes that increase in the acidity of the urine which has been noted. On the other hand, when the salt is taken during digestion, the acid contents of the stomach decompose it, carbonic acid is liberated which escapes by the mouth, whilst the alkaline bases pass into the system and cause the urine to assume an alkaline reaction.

The therapeutic indications to be drawn from these observations may be thus summarized :—

1. In cases of acid dyspepsia arising from the excessive formation of acid within the system, as in lithæmia, the alkaline bicarbonates should not be administered before food, but after.

2. The administration of alkaline bicarbonates before meals is indicated in those cases where the free acid is formed in the stomach itself, the result of fermentative changes of undigested food or morbid mucus, when it is necessary to diminish the too high degree of acidity thus caused in order to permit digestion to be properly performed.

MEDICINE.

Scarlatina following Operations.

The occurrence of scarlatina after surgical operations is a curious fact which merits the attention of pathologists as well as of surgeons. It cannot be regarded as a new observation ; for, so far back as 1864, Mr. Maunder raised a discussion at the Pathological Society, by relating two cases in children where the fever had shown itself after the operation of lithotomy ; other speakers were also able to narrate similar instances in their own experience. Sir James Paget, in his clinical lectures, devotes a short chapter to the consideration of this point. So far, therefore, as English surgeons are concerned, operative scarlatina is not an unknown complication ; but the condition, although not quite ignored by our Continental brethren, was one that, until lately, attracted neither comment nor research ; but in a lecture recently delivered at the Hôpital de la Charité in Paris, M. Trélat has rescued it from the oblivion in which it lay in his own country. This eruptive fever, following closely upon operative measures, is exemplified by the citation of some cases that have come under his notice, but not in his hospital wards. The first of these was a young child in whom a small sinus

in the thigh was laid open; the symptoms of scarlet fever appeared within twenty-four hours, and ran their course, but convalescence was extremely slow. The next patient was a young man, aged 17, of scrofulous diathesis, in whose case it was necessary to incise a small abscess in the epididymis, and to aspirate one of larger volume in the supra-pubic region. The patient showed febrile symptoms the next morning, and the following day the scarlatinal rash and sore throat made their appearance. The fever passed through its various phases; but, towards its close, the drainage of the supra-pubic abscess became defective, and an examination of the urine, made at this time, revealed the presence of albumen; but when a ready exit for the pus was effected, the albuminuria disappeared. The third case was that of a soldier, twenty years of age, who received a gunshot injury to the knee-joint during the Franco-Prussian war. Amputation being refused, resection of the joint was accomplished four days after receipt of the wound. Three days afterwards, on account of the high temperature and other signs of fever, the man was considered to be suffering from pyæmia; but a scarlatinal rash making its appearance almost immediately, placed the diagnosis beyond doubt.

This complication to surgical operations seems generally to attack young people and those who have not suffered from scarlet fever previously. It is not necessary for its appearance that an epidemic of the disease should be in force, for, in the last case quoted by M. Trélat, at the time of its occurrence, there was no scarlatina in the ambulance, but within ten days two patients were found affected with this form of fever. That such cases are scarlatinal has been proved by subsequently exposing those who have been attacked to the action of this particular febrile virus, without eliciting any result.

These being the facts, what is the causation of the fever, and why should scarlatina be selected in preference to any of the forms of eruptive fever? If called upon to pronounce an opinion without having previously thought over the subject, we should probably try to escape from the difficulty by either attributing the febrile conditions to septicæmic poisoning, or else by imputing to chance the appearance of scarlatina at this particular juncture; the idea of its having a traumatic origin, owing to some peculiar constitutional condition, does not seem to offer any satisfactory explanation. With regard to the fever being a form of septicæmia, several objections may be adduced: its sudden occurrence without premonitory symptoms (from one to three days is generally the intervening period after an operation), and the appearance of a rash, which is quite distinctive. In his cases, M. Trélat, in order to place this matter beyond doubt, sought in consultation the advice of physicians, and they had no hesitation in proclaiming the eruption to be that of scarlet fever. Septicæmia, according to Verneuil and Tremblay, may exhibit cutaneous manifestations, but the "boiled lobster" state of the patient is unmistakably scarlatinal. Though, at the onset, the eruption is distinctive enough, yet the desquamation in the fever following operations may be abnormal; the presence of the characteristic throat, together with the rash, is a strengthening link in the chain, but the faucial signs may be absent; the same may be said with reference to albuminuria. If it could be proved that no case of scarlet fever was ever found to follow an operation conducted on the principles of Lister, an important step would be gained for or against, as the case might be, the septicæmic theory. In one thing operative scarlatina and septicæmia are alike—both affect the wound and retard its healing.

In considering the appearance of the fever to be a matter of chance, we arrive at an explanation which has before been enunciated, and is accepted by M. Trélat, namely, that the poison of scarlet fever has previously been imbibed by the system, and that the operation, acting as an irritant or influencing unfavourably the

constitution in some other way, causes its manifestation at this particular time, when otherwise it might have passed away, or not have given evidence of its presence until a later date.   Sir James Paget inclines to this as the most probable explanation, but at the same time thinks that a surgical operation renders the subject more susceptible to a contagious poison, and that the usual period of incubation in such a case is much lessened.   These two hypotheses seem to be the most reasonable of any as yet offered; at all events, both contain a semblance of truth.

The patients of M. Trélat eventually recovered; but several cases with fatal termination have been reported by surgeons in this country; and Sir James Paget offers a valuable suggestion to the effect that the scarlatinal virus, not exhibiting itself, may be the cause of death in children, who succumb within a few days after an operation with obscure and unaccountable symptoms.

In our present state of knowledge, no suggestion can be offered for the reason of scarlatina manifesting itself, instead of chicken-pox, measles, or some other febrile disorder; it can only be said that such is the case as a matter of observation.   Puerperal scarlatina bears a marked resemblance to the same exanthema occurring after surgical operations, both in its commencement and in the abnormality of its course.   Among obstetricians, differences of opinion still exist as to the pathology of that disease.   M. Trélat frankly states that he is ignorant whether there is any intimate relationship between the operation and the fever; and in this respect he does not stand alone.   With an eminent authority, we must confess that the question is an important one, both as to the pathology of the disease and the risk of surgery.—*British Medical Journal*, Nov. 9, 1878.

The Differentiation of Coma from Alcohol.

Dr. Macewen, in opening the winter session of the Glasgow Royal Infirmary School of Medicine, chose for the subject of his address the means of distinguishing the coma produced by alcohol from that produced by apoplexy, opium, and other causes.   After alluding to Dr. Richardson's statement that in alcoholic coma the temperature falls, and that this is a distinguishing mark from other forms of coma, Dr. Macewen alleges that he has observed the temperature in a series of cases of fracture of the skull, opium-poisoning, and apoplexy, and that in all these cases the temperature was found very much below the normal.   Consequently this point is not to be relied on for purposes of diagnosis.   He also controverted the statement that in alcoholic coma there is dilatation of the pupil. He had found contraction the rule.   But he had accidentally discovered that if a patient was shaken or disturbed, the pupil dilated, but very soon contracted again. He therefore lays down the rule that an insensible person, who, being left undisturbed for from ten to thirty minutes, has contracted pupils, which dilate on his being shaken, without any return of consciousness, and then contract again, can be labouring under no other state than alcoholic coma.   Dr. Macewen's position in the Royal Infirmary of Glasgow gives his observations on this subject much authority.   But the test must have a larger trial before it can be finally accepted. —*The Lancet*, Nov. 16, 1878.

Curare in the Treatment of Epilepsy.

At the recent meeting of the German Association at Cassell (*Allg. Wien. Med. Zeit.*, October 1), Dr. Kunze gave an account, in the Section for Internal Medicine, of the trials which he had made of curare in the treatment of epilepsy.   Of eighty cases treated, six he regards as cured, the epilepsy having ceased for five years or more.   At the very least, then, his remedy has a great advantage over

the bromides, which only postpone the attacks for some half-year. Commencing in his trials of the remedy with doses of a milligramme, and working upwards, he soon found that even large doses could be borne, he remaining with his patients after these were administered in order to observe their effects. The doses to which he did attain would excite surprise. Thus to three grammes of water he added five decigrammes of strychnia, using this for eight injections. The early symptoms of narcosis, such as a little giddiness, and a misty veil before the eyes, passed away in three-quarters of an hour. He soon diminished the above quantity, adding only three decigrammes to five grammes of water and a drop or two of hydrochloric acid, and dividing into eight injections. No symptoms of poisoning were induced in the cases treated; but it is with this remedy as with strychnia, which exerts no influence if noises in the ear are not produced—so here no effect is produced unless there is a veiling of the vision. An important point to note is, that the cases may be divided into two classes as regards this treatment. First, there are those in which there have been only one or two attacks, or in children, in which a single injection may suffice; but, as a rule, a second attack follows in three or four weeks, and then we should observe what time has passed between the injection and the new attack, taking care to make the new injection before the same period of time has again elapsed.—*Med. Times and Gazette*, Nov. 2, 1878.

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Case of Abscess of the Brain following Otorrhœa.

In the *Sperimentale* of 1878, Fas. 4, Dr. D. BARDUZZI gives a case of otorrhœa followed by abscess of the brain. It occurred in a boy nine years old, who had been abandoned by his parents and wandered about in great misery. All the history which could be learned was that, three years before, he had received a severe blow on the ear, which had been followed by the issue of purulent matter, and that a few days before the child had been seized with strong fever, vomiting, and delirium. On admission to the hospital he presented the symptoms of typhoid fever of the cerebral type, intense pain, dry skin, temperature from 39° to 41° C., coma, meteorism of the abdomen, muscular contractions, subsultus tendinum, contracted pupil, dulness of intellect, and slow and confused answers. There was very scanty secretion of sero-purulent matter from the right ear; but the importance of this as a clue to the diagnosis was overlooked. The boy died forty-eight hours after admission, and it was only on a *post-mortem* examination that the nature of the case was cleared up. There was found a diffused congestion of the meninges, and a limited abscess in the posterior lobe of the right side of the brain a little larger than a pigeon's egg. The white substance surrounding the abscess was somewhat softened. There was perforation and thickening of the membrana tympani, caries of the upper wall of the auditory canal, and traces of inflammation in the lateral sinus.

Where suppuration is known to exist in the internal ear, Dr. Barduzzi recommends the employment of drainage, either continuous or repeated, thrice a day, and the use of injections of salicylic acid and chloral.—*Brain*, Oct. 1878.

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Sclerosis of the Spinal Cord, and the Results of Myelitis.

E. LEYDEN gives, in the *Charité Annalen* for 1878, the results of some experiments on the artificial production of sclerosis of the spinal cord with the view of determining, as far as possible, whether it is to be regarded as a special form of chronic myelitis, and what are its relations to acute myelitis. By injecting a few drops of Fowler's solution into the spinal cord of dogs, he was able to excite violent inflammation. One of the animals operated on survived fourteen months;

notwithstanding total paralysis and contracture of the hind limbs, its general health was good. After the animal was killed, a careful examination was made. The spinal cord at the seat of the operation was very thin, and was covered with a thick layer of fat; in the substance of the anterior cornua of gray matter was a cyst, having its origin in the softening of the tissue; there was also found a focus of rarefied matter, consisting of loose connective tissue with dead nerve-elements; and in the neighbourhood of the focus of softening, in the parts which at the beginning of the process were swollen and infiltrated with cells, was a tough sclerotic network containing only scattered nerve-fibres, without nucleated cells, but with some stellate cells and single nuclei. The muscles of the hind legs were the seat of interstitial fatty growths; the muscular fasciculi had almost disappeared; the motor nerve-roots were atrophied; the degeneration extended upwards in the form of a narrow strip in the posterior column as far as the cervical enlargement. The sclerosis, arising from acute myelitic processes or produced by experiments on animals, corresponds to the sclerosis observed in the human spinal cord, and appears to be an ultimate product of those inflammations of the spinal cord which, without essential destruction, lead to infiltration, and subsequently to atrophy.—*British Medical Journal*, Nov. 9, 1878.

Changes in the Sympathetic in Pseudo-Hypertrophic Paralysis and in Progressive Pernicious Anæmia.

Two cases in which the pathological changes of the sympathetic in these diseases were noted, have been described by Dr. BRIGIDI.

The first case, related in the *Imparziale* for February 28, was one of pseudo-hypertrophic paralysis. The subject, N. N., a man aged 30, and his two brothers, belonged to a poor family, and were obliged to labour at an early age. After some time, they all perceived difficulty in walking; their gait became tottering, and when standing erect they kept their feet wide apart. Two of them died, but of what is not known.

The signs of altered muscular function advanced, and extended to the muscles of every part of the body. As the disease progressed, the patient was obliged to walk with his body bent forward, curved, and his knees bent, his hands resting on his hips. This state continued about two years, during which he visited the hospital twice. On the last occasion, being in Dr. Morelli's ward, he was carefully examined; and some muscles were found to be much wasted, while others were more developed than normal. Electric contractility was weakened, and in certain points destroyed. The muscles of the face alone were healthy. The patient died of a pulmonary affection.

At the necropsy, the voluntary muscles presented the characters of hypermegalia or pseudo-hypertrophic paralysis. On examining the sympathetic, the ganglia, especially the cervical, were found to be a little more coloured than normal. In the cervical and cœliac ganglia, the central and peripheral veins were much dilated. The arteries, which were large and empty, were not dilated. The nerve-cells were diminished in number; those nearest the vessels appeared more or less atrophied, and contained many pigment-granules of a deep-red colour inclining to black. There was hyperplasia of the connective tissue, and in some cases true sclerosis. The nerve-fibres containing myelin were few and small. Remak's fibres were indistinct, and in some places were replaced by connective tissue. The veins in the cœliac ganglia were less distended; but they presented nuclear proliferations and fatty degeneration.

In *Lo Sperimentale* for May, 1878, Dr. Brigidi publishes an article on the changes in the sympathetic in a case of progressive pernicious anæmia. The subject was a woman, aged 53, who was admitted into the hospital on November 3,

1877, presenting all the symptoms of a well-marked state of chloro-anæmia. In the hospital the patient continued to grow worse, and, without ever presenting fever, and preserving motion, sensation, and intellect throughout, she died on November 12, in spite of the abundant use of tonics and chalybeates, and the administration of meat and wine.

At the necropsy there was found to be extraordinary paleness of the skin, mucous membranes, and almost all the tissues of the different organs. The *panniculus adiposus* was abundant. The cœliac ganglia, examined in the fresh state, showed an abundant proliferation of nuclei, in some parts filling the capsules containing the nerve-cells. These appeared for the most part strongly pigmented; and their protoplasm was so turbid that it was difficult to see the nucleus without employing reagents. The bloodvessels were empty. Subsequent examination of the same ganglia after hardening in alcohol revealed other noteworthy peculiarities. On looking at one of the groups of nerve-cells, there were seen, here and there, parts where the cells were replaced by a considerable number of small globular elements, giving to the tissue the appearance of granulation-tissue. An analogous nuclear proliferation, but less abundant, was observed in other parts of the ganglion, and especially among the nerve-fibres. Those last, and especially the medullated cells, had in large numbers undergone fatty degeneration. In the bloodvessels, the epithelioid lining was much developed and in a state of degeneration; they were empty, and their walls were plaited together; around them was a large zone of fibrillar connective tissue, poor in nuclei, and in some parts connective tissue with narrow meshes formed by the anastomosis of the prolongations of stellate cells.

The author regards the case as one of progressive pernicious anæmia, in consequence of the course of the disease (ascending and slow, never interrupted, and ending in death), of the paleness of the skin and mucous membranes, of the prostration of strength, of the cardiac and gastro-enteric disturbances, and of the appearances at the necropsy; and he explains the connection of the anæmia with the cœliac ganglia as follows.

The changes in the ganglia, by their influence especially in the chylopoietic apparatus, must induce disorder of the circulation in the stomach and intestines, and disturb digestion, the functions of the intestines, and the absorption of chyle. This is a first reason of the dyscrasia of the blood. Secondly, the above-mentioned ganglia exert a retarding action on the heart, and the number of respirations is in strict and direct relation to the cardiac contractions; hence, when once the cœliac ganglia are diseased, there should be a diminished absorption of oxygen—that is, diminished oxidation. Here is the reason why the blood must contain an excess of fatty matters, which are deposited in the tissues that are found to contain them.—*London Med. Record*, Oct. 15, 1878.

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Report on Membranous Croup and Diphtheria.

At a late meeting of the Royal Medical and Chirurgical Society, Dr. ANDREWS read the report of the scientific committee appointed to examine into the relation existing between the diseases commonly known respectively as membranous croup and diphtheria, of which the following is a summary of conclusions:—

1. Membranous inflammation confined to, or chiefly affecting, the larynx and trachea, may arise from a variety of causes, as follows:—

(*a*) From the diphtheritic contagion.

(*b*) By means of foul water, or foul air, or other agents, such as are commonly concerned in the generation or transmission of zymotic disease (though whether as mere carriers of contagion cannot be determined).

(c) As an accompaniment of measles, scarlatina, or typhoid, being associated with these diseases, independently of any ascertainable exposure to the especial diphtheritic infection.

(d) It is stated, on apparently conclusive evidence, although the committee have not had an opportunity in any instance of examining the membrane in question, that membranous inflammation of the larynx and trachea may be produced by various accidental causes of irritation—the inhalation of hot water or steam, the contact of acids, the presence of a foreign body in the larynx, and a cut throat.

2. There is evidence, in cases which have fallen under the observation of members of the committee, and are mentioned in the tables appended, that membranous affection of the larynx and trachea has shortly followed exposure to cold, but their knowledge of the individual cases is not sufficient to exclude the possible intervention, or coexistence, of other causes. The majority of cases of croupal symptoms definitely traceable to cold appear to be of the nature of laryngeal catarrh.

3. Membranous inflammation, chiefly of the larynx and trachea, to which the term "membranous croup" would commonly be applied, may be imparted by an influence, epidemic or of other sort, which in other persons has produced pharyngeal diphtheria.

4. And, conversely, a person suffering with the membranous affection, chiefly of the air-passages, such as would commonly be termed membranous croup, may communicate to another a membranous condition limited to the pharynx and tonsils, which will be commonly regarded as diphtheritic.

It is thus seen that the membranous affection of the larynx may arise in connection with common inflammation, or with specific disorders of several kinds, the most common of which in this relation is that which produces similar changes elsewhere, and is recognized as diphtheria.

In the larger number of cases of membranous affection of the larynx the cause is obscure (i. e., in any given case it is difficult to predicate the particular cause in that case).

Among those in which it is apparent common irritation seldom presents itself as the source of the disease; accidental injury is but very infrequently productive of it. But few cases of undoubted origin from exposure to cold are on record.

On the other hand, in a very large number of cases infective or zymotic influence is to be traced.

The membrane, even when chiefly laryngeal, is more often than not associated with some extent of a similar change in the pharynx or in the tonsils; and whether we have regard to the construction of the membrane, or to the constitutional state as evinced by the presence of albumen in the urine, it is not practicable to show an absolute line of demarcation (save what depends upon the position of the membrane) between the pharyngeal and laryngeal forms of the disease.

The facts before the committee only warrant them in the view that when it obviously occurs from a zymotic cause or distinct infection, and primarily affects the pharynx, constitutional depression is more marked, and albuminuria is more often and more largely present, though in both conditions some albumen in the urine is more frequently present than absent.

The most marked division indicated by the facts before the committee is that between membranous and non-membranous laryngitis.

The committee suggest that the term "croup" be henceforth used wholly as a clinical definition, implying laryngeal obstruction occurring with febrile symp-

toms in children. Their croup may be membranous or not membranous, due to diphtheria or not so.

The term "diphtheria" is the anatomical definition of a zymotic disease, which may or may not be attended with croup.

The committee propose that the term "membranous laryngitis" should be employed, for the avoidance of confusion, whenever the knowledge of the case is such as to allow of its application.—*Lancet*, Oct. 26, 1878.

Croup cured by Hypodermic Injection of Sulphate of Atropia.

Dr. DE PONTÈVES, of Antibes, has published (*L' Union Médicale*) a full account of a case of croup where a fatal termination seemed inevitable, but which resulted in recovery, owing, he believes, to hypodermic injections of sulphate of atropia. On the third day of the attack he found his patient—a child three years old—to whom the usual remedies had been given, in a state of commencing asphyxia. The efforts to breathe could be heard in the street; the epigastrium, instead of rising at each respiration, was hollow; the face and neck were enormously swollen and of a violet colour; there had been no attempt at vomiting, though large doses of sulphate of copper had been given. At once three drops of a one per cent. solution of sulphate of atropine were injected by a Pravaz syringe, on the left side of the neck, on a level with the pneumogastric. At the end of a few minutes a change for the better took place, the respiration became less frequent, and the crowing diminished. Four hours afterwards the child was found tranquil, and, though the respiration was still troubled, dyspnœa was no longer intense. A second injection was given and the amelioration shortly afterwards became very marked. A few days afterwards the recovery was complete. *A priori* the treatment is a rational one. The real cause of death in croup does not reside in the false membranes. M. Jaccoud, in his *Traité de Physiologie Interne*, speaks of the "very numerous cases in which croup kills without laryngeal obstruction sufficient to explain death." He adds that, "though often the expulsion of the false membrane is followed by great relief marking the diminution of the dyspnœa, yet the cases are far from rare in which the remission is absent or inappreciable—a fact sufficient to prove that croupal dyspnœa has more causes than the obstruction of the larynx by exudation." When the pneumogastric nerves of dogs are divided in the neck, what always happens is the occlusion of the glottis from paralysis of the recurrents, and after death there is found intense congestion of the lungs, pulmonary œdema, dilatation of the smaller bronchi, and vesicular emphysema. Now these symptoms and lesions are also observable in croup and capillary bronchitis. The essential cause, therefore, of asphyxia in croup seems to be the paralysis—more or less complete—of the pneumogastric. This view is supported by the fact that it is difficult, and often impossible, to produce vomiting. Belladonna, being an excitant specially of the pneumogastric, appears to be indicated in cases such as have been detailed.—*Dublin Journal of Med. Science*, Nov. 1875.

Lesions of Salivary Glands in Diphtheria.

In a paper recently contributed to the *Revue Mensuelle* MM. BALZER and TALAMON describe certain inflammatory changes in the parotid and submaxillary glands as almost constant concomitants of pharyngeal diphtheria. They remark that these changes have been strangely overlooked; for, although indicated by Dr. Samuel Bard, of New York, so long ago as 1771, in his work "On the Nature, Cause, and Treatment of Suffocative Angina," as occurring in some cases, yet Bretonneau and all succeeding authorities have considered that when

Bard spoke of swelling of the "parotic and sublingual glands," he was confounding them with the lymphatic enlargements which are a constant feature of the disease. Seeing how frequently the salivary glands, especially the parotid, became affected in infectious diseases, and noticing also that the peculiar aspect of the tumefaction beneath and behind the jaws in diphtheria was not explained on the ground of lymphatic inflammation alone, MM. Balzer and Talamon determined to investigate the condition of the salivary glands in this disease, and with the result of showing that Bard was right. Thus, after the lapse of more than a century, has a clinical observation been confirmed by pathological research.

The morbid changes noted by Balzer and Talamon concern both the cells of the glandular epithelium and the interacinous connective tissue. The former, in the slighter cases, are swollen and filled with homogeneous translucent mucoid material, and the cells of Gianuzzi are more numerous than normal. More often the acini are diminished in size, their cells small and glandular, presenting the appearances shown by Ranvier to exist after prolonged excitation of the nerves going to the gland. In other parts the acini are filled with small round cells, the glandular structure almost disappearing, and when this alteration is most extreme the accumulation of leucocytes is sufficient to form small abscesses. There is similar infiltration of the connective tissues within the lobules and acini, but less change in the perilobular and periglandular tissue. The lymphatics within the gland are stuffed with round cells, and often form small abscesses around the lobular ducts. The larger ducts show but little change, but this does not negative the idea that the inflammatory lesions commenced in them, or rather travelled down them to the glandular substance. These changes were found in all the cases of diphtheria examined, without regard to the mode in which death had occurred. Applying these facts to those observed at the bedside, they point out that quite early in the disease there is swelling of the neck beneath the jaw as well as behind its angle. The swelling in the latter situation, and extending along the border of the sterno-mastoid, is due largely to enlargement of the chain of lymphatic glands, which receive their lymphatics from the palate, uvula, and tonsils. Part of the swelling may, however, be due to parotitis, and often there is, in addition, some œdema of the surrounding connective tissue. The submental enlargement is solely due to the inflamed submaxillary gland. It is not dependent on enlargement of the lymphatic glands lying here, for not only do they not receive lymphatics from the parts affected by the diphtheritic inflammation, but after death these lymphatic glands are barely if at all enlarged. The same argument applies to the view that the swelling in the parotid region is due to lymphatic and not salivary gland inflammation, for here also no lymphatic vessels pass from the pharyngeal region. They hold, then, that there are three factors in the production of the swelling of the neck in diphtheria : firstly, lymphadenitis, leading to the painful, small, hard tumours behind the angle of the jaw and along the sterno-mastoid ; secondly, inflammation of the salivary glands, producing the uniform, smooth, elongated swelling beneath the lower border of the jaw, and that which fills up the hollow immediately behind the ramus ; and lastly, the general swelling of the hyoidean region, due to inflammatory œdema, of the cellular tissue. Whether the inflammation of the salivary glands is primary or secondary to lymphatic inflammation they give no definite opinion ; but owing to the very early appearance of the swollen submaxillary glands, they do not think it due to the general blood-condition, as in the parotitis of specific fevers.—*Lancet*, October 19, 1878.

Dyspnœa in Acute Pleurisy.

Dr. DIEULAFOY takes the occasion of two cases (which have recently come under his notice at the Charité) of pleurisy with effusion (*Gaz. Hebdom.*, September 27), for making some observations on dyspnœa as observed in this affection. It is generally believed, he says, that dyspnœa is one of the most common symptoms observed in pleurisy with effusion ; and certainly, at first sight, it seems quite natural, when two litres of liquid exist in the chest, when the lung is flattened and thrust back by the effusion, and when hæmatosis is only imperfect, that the breathing should be oppressed. And yet such oppression does not exist, or only to an insignificant extent. Effusion, when it amounts to a very large quantity, impedes respiration but slightly, so that *dyspnœa is not to be regarded as an habitual symptom of pleurisy with effusion.* This is a point of great practical interest in relation to the indications of thoracentesis.

A medical student at the Charité observed his breath to be a little short, but to so slight an extent that he pursued his studies at the hospital as usual, and it was almost by accident that his chest was examined, and found to contain more than two litres of liquid. His health was excellent, and he only felt somewhat out of breath when he walked quickly or ran upstairs. Respiration was only 21 in place of the normal 16 or 18. Dr. Dieulafoy practised two aspirations, at intervals of two days, only removing, according to his usual practice, a litre of fluid at each, leaving the remainder, which was absorbed in a few days. The second case occurred in the person of a man-servant who had suffered from a left pleurisy for nine months, during which period eighteen blisters had been applied without effecting a cure. After the acute stage had passed away, for which he had kept his bed, he resumed his duties, but found his respiration still somewhat embarrassed. Still the oppression was very tolerable, as it allowed him to continue the hard work of polishing the floor daily, and sometimes ascending the box of the carriage. He spoke at all times with an ease and vivacity that conveyed no idea of a person suffering from dyspnœa. And yet, on examining his chest, Dr. Dieulafoy found an amount of effusion such as he had never met with before—the heart beating beyond the right nipple, almost in the right axilla, the right lung being to some extent also thrust backwards. After the examination of the chest the quantity of liquid was estimated at five litres, and after so long a sojourn it must have become hæmatic or purulent. But when the liquid becomes purulent in chronic pleurisy, the general symptoms are habitually marked, the patient losing his appetite, becoming thin, with shivering and sweating and febrile elevation of temperature, especially at night. Nothing of this sort was observed in this patient, who had a good appetite and no fever, and was polishing floors until the day before admission. At the examination his respirations only amounted to 27, a much inferior number to that furnished by bronchitis, pulmonary congestion, or the smallest nucleus of a pneumonia. On a puncture being made in order to withdraw the first litre, a thick layer of false membranes had to be traversed, and the liquid withdrawn was hæmatic.

Many other examples might be cited, and among these the case of a person who believed himself to be cured of a pleurisy of three weeks' standing. So little was his respiration embarrassed, that the respirations were only twenty-two, and yet paracentesis, practised three times, withdrew three litres of liquid. This want of accordance between the dyspnœa and the effusion has often been noted, but it has been perhaps too much regarded as an exception, while it would seem to be the rule. Among several examples, Trousseau relates that a nurse came four kilometres on foot to the Necker, carrying her child, without seeming to be much fatigued ; and yet on paracentesis being performed, 2500 grammes of fluid

were withdrawn.   Similar cases are related by Andral and Laudouzy : and it is a fact that even abundant effusions in general only induce but an insignificant amount of oppression—a fact which there is too much tendency to forget when it is sought to make dyspnœa the principal indication for paracentesis.   It may be objected that there are patients who, from the very commencement of the pleurisy, and with but little effusion, yet exhibit considerable dyspnœa.   This is only a misunderstanding of the term.   At the commencement of a pleurisy, in fact, and during the sometimes so painful early stage, when the pain in the side (*point de coté*) is so acute, the patient may have short, interrupted, and jerking respiration, and he is said to have dyspnœa.   His breathing is indeed difficult, but it is difficult and impeded only because it is painful, effusion having nothing to do with it, as it does not yet exist.   This dyspnœa at the commencement, then, is a false dyspnœa, and is not due, like true dyspnœa, to defective and insufficient hæmatosis, but to the pain which limits the respiratory movements and destroys their normal rhythm.   The proof of this is that the breathing becomes easier in proportion as the pain disappears, although the effusion is making incessant progress : and it is often when the liquid has reached its apogee, attaining two or three litres, that the patient believes himself cured, because he is then free of fever and of pain.   During the acute stage of pleurisy, also, febrile action accelerates the respiration : for whatever may be the cause of fever, it renders combustion active, and consequently accelerates the respiratory rhythm.   But fever is in general very moderate in pleurisy, and exerts but a slight effect on the respiration.   Nevertheless, both pain and fever are two of the elements of pleurisy which, by a different mechanism, may engender disturbance of the respiration : but when these two elements have disappeared, or have not existed (as in certain subacute pleurisies termed latent), the patient has no dyspnœa, notwithstanding the large accumulation in his pleura.   He certainly is not able to make the same exertions as a man in good health : but when he is in bed, and in the repose which any patient must be in order to undergo a medical examination, the dyspnœa is so insignificant that it ought not to be regarded as an element of diagnosis, and should not be accepted as an indication for paracentesis.

This association between a large effusion and an almost normal respiration, which at first seems so strange, is not difficult of explanation.   In the physiological condition respiration is not exerted alike over the whole pulmonary surface, certain parts of the lung, especially the superior lobes, contributing but very little to the function.   But in a pathological condition, when the play of the lung is impeded by the presence of an effusion, the healthy lung comes into action through its whole extent, and nearly re-establishes the equilibrium in the phenomenon of hæmatosis.

The first consequence which results from this absence of dyspnœa in pleuritic effusion is that dyspnœa furnishes only insufficient or unsafe indications when an operation has to be decided upon.   To delay evacuating the pleura until the patient is attacked by dyspnœa is to wait until the effusion has attained proportions so considerable that the life of the patient has already been long in danger by the time the decision is arrived at.   All the cases in which sudden or rapid death has occurred during the course of a pleurisy with effusion are neither known nor published, but those which have been published show us that the patients generally die on account of cardiac coagula, coagula of the pulmonary arteries, and thrombosis favoured by the entirely mechanical conditions of displacement, torsion, and flattening of vessels, and of the obstructed circulation due to the effusion.   Another consequence arising from this absence of dyspnœa is, that when it is present in pleurisy it is a sign of a complication : so that whenever a patient, the subject of pleurisy with effusion, presents more than from twenty-eight to thirty respira-

tions per minute, we know that we have something besides a pleurisy to deal with. If careful examination be made it will be found that the pleurisy is secondary, developed in the course of Bright's disease, or of a cardiac affection with congestion of the lung : or the pleurisy is associated with other diseases, as double pleurisy, bronchitis, pneumonia, pericarditis, fluxion of the chest, or pulmonary congestion.

·· To sum up—1. Dyspnœa is not one of the habitual symptoms of pleurisy with effusion. Pleural effusions, even when they reach 1800 grammes or two litres, only accelerate the respiratory rhythm by four or five respirations per minute. I am not speaking, be it well understood, of the painful period which is often accompanied by false dyspnœa, and I make reserves in the cases in which fever is still vivid. But under all other circumstances, in the apyretic phase of pleurisy, and subacute, latent, and chronic pleurisy, dyspnœa is a symptom so *anodin* that it does not merit being taken into consideration in reference to diagnosis, prognosis, or treatment. 2. On the other hand, when a true dyspnœa is proved to exist during the course of a pleurisy, we must always be on our guard against a complication, whether the pleurisy be secondary (as in Bright's disease or affection of the heart), or whether it be associated with other phlegmasiæ or pulmonary congestion."—*Med. Times and Gazette*, Oct. 12, 1878.

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Syphilitic Phthisis.

Dr. A. FOURNIER communicated to the Académie de Médecine (*Gaz. Méd.*, November 23) a case of tertiary phagedæna of the foot, and syphilitic phthisis. The seat of the phagedæna is in the highest degree unusual, and the simulation of ordinary phthisis was remarkable. When the woman entered the hospital, the lesion of the foot had already destroyed the second and third toes and a part of the fourth, and her general aspect was that of extreme cachexia. She had coughed and expectorated during several months, and the examination of the chest revealed advanced lesions. All the ordinary symptoms of pulmonary consumption were present—this being the essential characteristic of the case. But before long, under the employment of a specific treatment for the phagedæna, improvement began to take place, and gradually her cure became complete.

Dr. Fournier observes—1. Such is the well-known frequency with which tuberculosis occupies the apex of the lung, that any lesion of this organ that is so localized is immediately, from this very fact, set down as ordinary phthisis. This generalization is, to say the least, excessive ; for syphilis—to speak only of it—may, like tubercle, occupy this seat ; and when it effects a lodgment there it assumes the mask of phthisis, and may thus give rise to error. 2. What is no less true, is that every pulmonary lesion accompanied by general symptoms gives rise to a suspicion of tuberculosis : and a patient with such lesion, who wastes away, is at once pronounced a subject of phthisis. This is another hasty generalization, for pulmonary lesions having a syphilitic origin will be attended by the same symptoms. Most positively there is a pulmonary consumption of a syphilitic nature—a syphilitic phthisis entirely comparable with the phthisis of tuberculosis. 3. This patient has owed her recovery entirely to the phagedæna of the foot, which has saved her ; for it was solely in reference to this lesion that the specific treatment was resorted to. Without this she would certainly have died, for there was no other indication for specific treatment, and the ordinary treatment of phthisis would have been for her a sentence of death. 4. The most curious point about the case is the fact of the cure having been obtained amidst conditions to all appearance most deplorable. When she was admitted no one would have believed that she would quit the hospital except for the dead-house ;

and yet she was dismissed cured of the phagedæna, of the lesion of the lung, and of the cachexia. This proves that syphilitic lesions of the lungs, far from being curable only in their early period, and in their benign forms, are so even in their most advanced stages and menacing forms—even after extensive infiltration, softening, or the formation of cavities has taken place, and when the general symptoms present themselves under all the aspects of true phthisis. They may, in fact, be cured, as in this case, contrary to all expectation, in patients who are exhausted, etiolated, and cachectic in the strongest sense of the word.—*Med. Times and Gaz.*, Nov. 30, 1878.

The Treatment of Thoracic Aneurism.

In an article contributed to a recent number of the *Revue Mensuelle de Médecine et de Chirurgie*, Dr. DRESCHFELD, of Manchester, deals with the three chief methods of treatment of aortic aneurism—viz., that by the administration of iodide of potassium, that of restricted diet and enforced rest in the horizontal position, and that of galvano-puncture. He prefaces his record of six cases in which some or all of these agents were employed by a slight sketch of each method and its *rationale*. He bears strong testimony to the efficacy of the iodide, first introduced by Bouillaud, and since warmly advocated by Balfour and others, but admits that it is not positively known how it acts. It probably slows and diminishes the action of the heart and the arterial pressure—an effect due rather to the iodine in the salt than to the potassium. Large doses (he advises small doses to commence with, and their increase up to six grammes or more), long continued, often give good results, especially in old subjects, and when the aneurism is of recent formation and small in size. Of the second plan—best known as Tufnell's treatment—that of absolute recumbency and a restricted non-liquid diet. Dr. Dreschfeld states that in nearly all the cases he has employed it the pulse-rate has been much diminished. Galvano-puncture, however, is the most certain in its effects of all the methods, since it promotes coagulation in a threefold manner: chemically, by the electrolytic decomposition of the water and salts of the blood; mechanically, by the inserted needles acting as foreign bodies; and, thirdly, by acting as an irritant and exciting inflammation of the wall of the aneurism. The ill results that sometimes, but rarely, happen from its use, he believes to be preventable, and he has never seen any embolism occur from detachment of clot formed during the procedure. The currents employed should be of weak intensity, and the time during which they should be allowed to pass ought to be at least thirty minutes. The needles should be of steel, and should be long and fine, well-pointed and polished, and coated with insulating material, such as varnish or gum, except at the points. Two or three may be inserted, not too close together; and it is best to connect them with the positive pole, the negative electrode being a moistened sponge applied to the skin in the neighbourhood of the tumour. In one case, however, the needles were attached to the negative pole, and with good result. The number of elements employed should be at first small, and should then be gradually increased at intervals of five minutes; and he allows three or four weeks to elapse before repeating the operation. Details of six cases are then given. The first, an extensive fusiform aneurism of the ascending aorta in a gardener thirty-eight years of age, was first treated with the iodide, and three weeks later by galvano-puncture, the negative pole being in the sac, and the number of elements (Weiss) increased from five to fifteen. The operation was followed by marked improvement, and was once repeated. The patient lived for nearly four years, pursuing his ordinary avocations, and the sac of the aneurism was found to be largely occupied by a thick firm material resembling embryonic fibrous tissue. In the second case, also of

the ascending aorta, much relief was produced by the iodide and by rest, but the patient died soon after from an intercurrent attack of pericarditis and pneumonia. In the third case all three methods were had recourse to, and galvano-puncture was thrice performed, the needles being connected with the positive pole. The number of elements ranged from three to twenty-two, and each operation lasted about an hour and a half. The tumour, which was of the size of a small apple, ceased to pulsate, and became firm, remaining so six months afterwards, when the patient, a female forty-four years of age, was last seen. The fourth case was one of a very formidable character, the aneurism almost filling the left half of the thorax, and being on the point of rupture. In spite of iodide of potassium, morphia, and the application of ice, it continued to increase; and a week after admission galvano-puncture was had recourse to. The needles connected with the positive pole were inserted, five to twenty-nine elements used, and the operation continued for two hours. It was repeated again a month later, when four needles were used, and the current allowed to pass for three hours; and again about three weeks afterwards, when the operation lasted four hours. A fourth galvano-puncture was made within three weeks from the third; but death occurred ten days later. In the remaining two cases, the iodide and Tufnell's treatment were employed; in one with great amelioration. Dr. Dreschfeld thinks these cases show the advisability of combining, as far as possible, all three methods of treatment, employing first the medicinal, dietetic, and postural methods, before having recourse to galvano-puncture, which should, however, in no case be long delayed. He has seen no benefit from the subcutaneous injection of ergotin, and thinks ligation of the carotid should be restricted to cases of innominate aneurism.— *Lancet*, Oct. 12, 1878.

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Chloride of Ammonium in Hepatic Diseases.

Dr. WILLIAM STEWART adduces fresh instances of the vast value of this agent in diseases of the liver, in the *British Medical Journal*, September, 1878, p. 467. It was in the year 1870 that Dr. Stewart first drew attention to the use of chloride of ammonium in diseases of the liver, as met with in the tropics; and subsequent papers have explained the general and special action of the drug on the congested or inflamed liver.

The following remarkable train of effects follows the ingestion of a twenty-grain dose, the only contra-indication for its use being a dry and hot skin; under which circumstances some simple diaphoretic ought to precede its administration. As a general rule, about fifteen minutes after taking the medicine, the patient experiences a sensation of warmth in the epigastrium, which by and by extends, pervading the abdomen, and gradually becomes diffused over the entire cutaneous surface. The nervous system becomes exhilarated, the circulation excited, the patient feeling light-headed or possibly drowsy. Acute pain, previously felt in the hepatic region, is either entirely removed, or, in its place, pain is referred to the axillary region, where it was not previously complained of; the patient now often falls asleep, and shortly a full and free perspiration breaks out, lasting one or two hours. Again the pain returns to its original position, but mitigated; and with the next dose of the medicine, at the expiration of six or eight hours, similar phenomena result. After several doses the urine becomes very abundant, the appetite is much improved, and the hepatic mischief vanishes. Sometimes after taking the chloride (in five minutes to half an hour) a peculiar sensation may be felt in the hepatic region, variously described by patients as a "shock," "pulling," "pins and needles," a "clawing," "working," or "gnawing sensation," none of which are to be interpreted as the medicine disagreeing, but the

contrary. Dr. Stewart congratulates the profession that the brilliant results following the use of chloride of ammonium, both in this country and abroad, are becoming more generally recognized. Dr. Murchison, in the second edition of his work upon *Disease of the Liver*, 1877, p. 624, thus speaks of the drug : "The chloride of ammonium holds a pre-eminent place" among remedies for functional disorders of the liver, "being of great service in the functional derangement of the liver attended by lithæmia."—*London Med. Record*, Nov. 15, 1878.

On the Oleate of Zinc in the Treatment of Eczema.

Dr. H. Radcliffe Crocker, Assistant Medical Officer in the Skin Department University College Hospital, calls attention (*Brit. Med. Journ.*, Oct. 26, 1878) to the value of oleate of zinc in eczema. It is prepared by stirring together one part by weight of oxide of zinc with eight fluidounces of oleic acid as free from palmitic acid as possible, and, after letting it stand for two hours, heating it until the zinc is completely dissolved. On cooling, it forms a yellowish-white hard mass, which can be made into the consistence of ointment by the addition of one part of vaseline or olive-oil, or two parts of lard or simple ointment. Vaseline is preferable, as it is not liable to change. The other preparations, soon becoming rancid, should be freshly made, and then answer equally well and are much more economical. Mr. Martindale has also spread it on thin paper, which is a convenient way of applying in some cases.

The above preparations Dr. Crocker has found very effectual in acute and chronic eczema in the discharging stage. In the dry stage, it is also useful ; but in many cases more stimulant remedies cure more speedily. The two following will show its mode of application and its merits, and are chosen as being the first two in-patients on whom it was tried, while the extent and duration of the disease were sufficient tests of its value.

Case I. O. N., a boy aged 7, was admitted into University College Hospital on May 7th, under Dr. Tilbury Fox, with a history of having been treated in a provincial hospital for twelve months for general eczema with only slight benefit. How long he had been suffering before this was not ascertained. On admission, the face, neck, and scalp were covered with pustular eczema. Thick yellowish crusts, with copious purulent discharge, were present in these situations ; and the eyes were nearly closed by discharge and swelling. Both buttocks, thighs, and legs were also affected ; and there were a few patches on the trunk. The discharge was free, but not purulent in these parts. The following treatment was employed : The hair was cut off, and the parts soaked in olive-oil all night to soften the crusts, which were then bathed off with warm water. On May 8th, the oleate of zinc ointment, made with lard, was spread upon linen rags and applied closely by means of a bandage ; the parts were kept constantly moist with the ointment ; new crusts were removed as fast as they formed ; and every day all the old ointment was wiped off before fresh was put on. A drachm and a half of "Parrish's food" and a drachm of cod-liver oil twice a day were also ordered.

May 13th. Great improvement was manifested. The discharge and scabbing were much less. He continued to improve ; and on May 27th it was noted that the face, scalp, and neck were now almost clean, with only slight discharge ; while the buttocks and legs were quite dry. On June 2d, there was no discharge anywhere, and only patches of diseased surface were left, with thin dry scales ; and thymol (five grains to the ounce of ointment) was then added. On June 13th, he was discharged well, with no trace of eczema anywhere, and the general health much improved.

Case II. A boy aged 10 had chronic eczema on the thighs and legs for two years. The medical man who sent him wrote: "He has been to all the surgeons in the neighbourhood, and no one appears to do him any good." He was admitted on May 23d. Similar treatment to that of the first case was employed, and he also was discharged cured on June 13th.

In addition to the above, Dr. Crocker has treated more than twenty out-patients during the last six weeks with this remedy. Six have been quite cured, and the rest are still under treatment; but all are improving—some very rapidly—in spite of the disadvantages attending out-patient treatment, owing to imperfect removal of crusts, the intermittent application of the dressings, etc.

The oleate of zinc ointment is a remedy of the same class as Hebra's unguentum diachyli; and, while beneficial in all forms of eczema, its most striking effects are seen in the discharging stage, and, so far as Dr. Crocker's experience has gone, it never seems to do harm in any case, as happens when stimulating remedies are injudiciously applied.

Since writing the above, three months ago, Dr. Crocker has treated a large number of cases with this remedy, with most satisfactory results, so that he can with confidence recommend it as one of the most useful preparations for eczema that we possess.

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Inflammatory Fungoid Neoplasm.

At the late meeting of the American Dermatological Association (*Archives of Dermatology*, Oct. 1878) Dr. Duhring, of Philadelphia, reported a case of this. The first affection of the skin from which the patient (a married lady of fifty-eight) ever suffered was an acute attack of what seemed to have been vesicular eczema, in August, 1876. This was followed by repeated attacks of urticaria, showing excessive irritability of the skin; and in October of the same year the first manifestation of the present disease made its appearance. This was a red spot on the right side of the forehead, of the size of a dime, not inflammatory, and looking like a superficial burn.

It gradually increased in size, and in August, 1877, began to rise slowly above the level of the skin, when it assumed a purplish hue, and presented the appearance of a boil. There were no subjective symptoms. Later, a number of tumours, of various character and sizes, appeared on the forehead, scalp and face, and also upon the trunk and extremities, most of them coming very suddenly, and some of them disappearing almost as rapidly. Later, some of them gave rise to considerable pain, and also to intense itching. In one day nine new, small tumours came upon the scalp, they were like gristle to the touch, freely movable, and soon disappeared; also there appeared, without her knowing when, tumours upon her buttocks and back.

Dr. Duhring saw her first October 25, 1877. The previous history, as given by patient, Dr. D. thinks reliable, she being a remarkably intelligent woman. When seen by Dr. D. the lesion involving the right side of the forehead (the original lesion), was of the size of a half cherry, of a raspberry colour, tense, containing no pus, tuberculated and furrowed. Inside of right arm was an oval patch, dull red in colour. The natural lines of the skin were exaggerated. There was another tumour in the posterior fold of right axilla. Several patches were upon the abdomen. There was a patch in the groin half an inch in height, shape of a hen's egg, and smooth. There was much dusky yellow pigmentation. On October 26th Dr. Duhring observed a new lesion that had appeared since the night before. It was near the nipple, olive-shaped, rough, of a deep pinkish colour, soft and supple—not inflammatory, not changing colour on pressure. It was evident that while tumours were continually appearing, they were almost as

rapidly disappearing. Some were persistent, as those upon forehead. Some lesions grew with great rapidity. The growths extended over forehead, eyebrow, and scalp, both flat and tuberculated. Some of the patches disappeared as rapidly in a few days. One tumour upon the left cheek softened and suppurated. This tumour, after it had existed three months, was excised. Its cut surface was grayish yellow, and firm, like sarcoma. Its weight was one ounce.

Under the microscope ($\times 300$), specimens of integument from them presented the following characters: The whole of the corium was infiltrated with a new growth, the cells being more abundant in its deeper portions. The walls of the hair-follicles were also packed with neoplasm. The cells were homogeneous in character, not being nucleated, as a rule. Some of them, however, had nuclei. There were but few spindle-cells, as far as could be seen; nor was the connective tissue or elastic-fibre bundles conspicuous.

New developments continued to manifest themselves from time to time, and on July 2, 1878, Dr. Duhring strangulated a large tumour on the left cheek with a ligature. On July 4th ablation was performed, and this was followed by severe hemorrhage; but the operation finally resulted in the most successful manner. This tumour was presented to the Association, and although it had been kept in alcohol, it was still of the size of a very large horse-chestnut. It weighed one ounce when first removed Before this time the internal administration of iodide of sodium, and later of arsenic, had been tried; but instead of being of any service, they both seemed to greatly aggravate the disease.

Dr. Duhring regarded the affection not only as new, but of such a grave character as to make it deserving of the closest study. Its course seemed entirely at variance with the ordinary manifestations of disease, and the fact that the general health remained unimpaired seemed to indicate that it was confined exclusively to the integument. There were two principal lesions—the flat patches and the round, tumour-like growths. The former were of various sizes, slightly elevated, dry, scaly, chapped-looking, and furrowed, and were followed by dirty, yellow pigmentation. The tumours varied in size from that of a split-pea to that of an egg, some being soft and others firm to the touch. They were either smooth and tense, or else had an excoriated surface, from which oozed serous and bloody fluid, and they were distinctly furrowed or lobulated. The subjective symptoms were principally itching, with occasional pain and a burning sensation. One of the most remarkable features of the disease was the exceedingly rapid development, and sometimes equally rapid disappearance, of the lesions noted. When the tumours underwent involution, pigmentation was usually left, but no permanent scars. Hebra first met with a case of this affection in 1872. He described it as new, and simply called it *neoplasma* He met with a second case in 1874, which had been described by Hans Hebra and Geber; and these Dr. Duhring believed were the only two cases on record. During the course of the reading of the paper Dr. Duhring presented microscopical specimens from his case, as well as photographs and paintings representing its gross appearances; and at its conclusion exhibited the patient herself, whom he had induced to come on from Philadelphia.

The patient pointed out several large tumours upon different portions of the body, which had appeared in the few weeks' interval of Dr. Duhring's absence from Philadelphia. Some of these were quite as large as pigeon's eggs, and were already undergoing involution, the process beginning in the centre. A remarkable feature was the perfectly normal condition of the skin at the points where tumours had been, but had disappeared. There was not the slightest evidence of interstitial absorption.

Nature of Iodide of Potassium Eruption.

At a late meeting of the Royal Medical and Chirurgical Society (*Lancet*, Nov. 16, 1878), Dr. GEORGE THIN read a paper on this subject in which he gave the results of a microscopic examination of a portion of skin which was the seat of a bullous eruption, occurring in a patient who had been taking iodide of iron and iodide of potassium for three months' constitutional syphilis. The patient, a man aged thirty-five, the subject of renal and mitral regurgitant disease, was, when he died, under the care of Mr. Howard Marsh, at St. Bartholomew's Hospital. He ceased to take the iodide on May 10th, the eruption came out on the 13th, he was admitted into the hospital on the 18th, and died on the 22d. The eruption occurred in the form of bullæ and pustules on the face and on the dorsum of the right hand. Its nature was recognized by Mr. Marsh, Mr. Baker, Mr. Langton, and Dr. Crocker. The part examined was from the dorsum of the hand. The cutis under the bullæ presented three distinct areas of morbid change. The innermost area was composed of a structureless, almost homogeneous, but faintly granular substance, containing at several points rows of leucocytes; the middle area was composed of a layer of exudation cells suspended in a very delicate reticulum; the outer area was formed by remnants of connective tissue bundles separated from each other by wide spaces. There were a few bloodvessels in the second area, and a large number in the third. The vessels were distended by red corpuscles, and their walls were in many instances partially disorganized. The substance in the inner area consisted of coagulated albuminous material from the blood. The third area was bounded almost abruptly by the ordinary bundles of connective tissue of the cutis. The sebaceous glands were unaffected. Portions of bloodvessels in the deeper strata of the cutis, and distant from the bulla and from the sebaceous glands, were found distended and plugged with disorganized blood. The epidermis over the inner area was ruptured and disorganized. The bulla was formed by injury to the walls of the bloodvessels of a limited area, and by consequent escape of blood fluid, which displaced the connective tissue, pierced the rete mucosum, and accumulated under the horny layer of the epidermis. The author points out that the tendency of iodine, when present in the blood-current, to attack special points of the vessels, as has been shown in this case, explains all the varieties of eruption produced by iodine. The injury in its mildest form is shown in the common iodine-acne, in a more severe form in bullous and pustular eruptions, and in iodine-purpura. As an explanation of the latter form it is suggested that a portion of the wall of the vessel is so suddenly and completely destroyed that the local changes are limited to effusion of a small quantity of pure blood, and to plugging of the vessel. Amongst various conditions which it might be imagined act as causes of the more severe forms of iodine eruption, it is suggested that a sluggish circulation and deficient excretion may find a place, and some such hypothesis might be framed to explain why in the present case the eruption only appeared during the week preceding the patient's death.

Dr. BAXTER remarked upon the singular fact that the eruption did not appear until some time had elapsed after the drug was discontinued, and thought it would be interesting to know whether any of the iodide (usually so rapidly eliminated) occurred in the urine at the time of the eruption.

Dr. BARLOW said the question raised by Dr. Baxter was of importance; for in several cases he had seen of iodide and bromide eruption the rash had not appeared until after the drug had been discontinued. In one case which Dr. Lees had reported, bromine was found in the urine some weeks after its administration had been withheld. In several cases disease of the kidney had been found, which pointed to retarded elimination being possibly the cause of the eruption; thus

disproving Mr. Hutchinson's statement that on withholding the drug its effects disappear. He inquired whether there were any other *post-mortem* evidences of iodide of potassium poisoning, such as œdema of the glottis, or, as had been described by some French writers, a condition of "dissolutio sanguinis." Dr. Thin's paper was, he believed, the first contribution to the microscopical anatomy of those eruptions, and the view maintained seemed very reasonable, and preferable to the current but superficial doctrine of rash being due to an affection of sebaceous glands.

Dr. THIN, in reply, said he would endeavour to ascertain the facts asked for as to the condition of the urine and the occurrence of other morbid changes attributable to iodide. The important point practically was that if in renal disease iodine is but slowly eliminated, great caution should be observed in the administration of this powerful drug in depressed conditions of the system. The fact that the eruption favoured exposed parts, such as the face and arms, where the circulation was retarded, bore out the view that the iodine acted on the vascular walls, as in these parts it would have a greater opportunity of so acting. The specimen exhibited showed well the limitation of the changes to a small part of a vessel, which was dilated at that spot and blocked with coagulum.

SURGERY.

Experiments on Transfusion.

At the meeting of the Société de Biologie, Dr. BROWN-SÉQUARD gave an interesting account of his experiments on transfusion. He had made use of different sorts of liquid for transfusion, such as normal blood, blood without its fibrine, and milk. In each case he found the results to be the same, but in the case of the milk the quantity that it was necessary to inject was more considerable than in the others. Ninety-five grammes of blood were drawn from a dog, and were replaced by the same amount of milk. Shortly after the operation (about forty-five minutes) there was no trace of milk-globules to be found in the blood, and the dog has continued in excellent health ever since the operation, which took place more than five months ago. M. Malassez found, upon examining the blood after the transfusion, a greater number of white globules than normal. In concluding his remarks, Dr. Brown-Séquard expressed the opinion that it was preferable to choose the arteries rather than the veins, and recommended the operation to be done very slowly, in order to allow the liquid injection to acquire the temperature of the blood. Transfusion also succeeds in animals when the blood made use of comes from a species of animal different from that of the one under experiment. It appears that Dr. Thomas, of New York, has tried the transfusion of milk on the living subject, and is convinced that it acts as well as blood.—*Lancet*, Nov. 2, 1878.

Treatment of Nævus by Sodium Ethylate.

Dr. J. BRUNTON, at a late meeting of the Medical Society of London (*Lancet*, Nov. 2, 1878), read a paper on the Treatment of Nævus by the External Application of Sodium Ethylate, exhibiting cases in illustration. Case 1. F. S——, aged seven, had, about a week after birth, a small red spot slightly raised on the cheek, which, at about the age of four months, had developed into a nævus of the size of a half-crown piece, bluish-red, and raised. It was treated, but with

only partial success, by ligature and needles, and when the sodium ethylate was applied, the growth was the size of a crown piece. Case 2. Also a female child, where a nævus was seated over the anterior fontanelle, the size of a shilling. In the first case the original nævus yielded in about a couple of months to the treatment, the continued obliteration of the fresh growth lasting for about a year. Sodium ethylate, which was first obtained and used by Dr. Brunton in 1871, is prepared by adding the metal sodium piece by piece to some absolute alcohol in a wide-mouthed bottle; cautious addition of more sodium until effervescence ceases results in the deposition of a crystalline substance—C_2H_5NaO—at the bottom of the flask. The credit of bringing this substance and other alcoholic and ethylic derivatives before notice was due to Dr. Richardson, who, in a communication on the subject to Dr. Brunton, writes: " When it is brought into contact with water it is decomposed, the sodium becoming oxidized by the oxygen of the water to form sodium hydrate, and the hydrogen of the water going to reconstitute the common or ethylic alcohol. The change of ethylic alcohol into sodium alcohol transforms it from an irritant to a caustic. Laid on dry parts of the body the sodium ethylate is comparatively inert, creating no more change than the redness and tingling caused by common alcohol; but as soon as the part to which the substance is applied gives up a little water, the transformation described above occurs, caustic soda is produced in contact with the skin in proportion as water is eliminated, and there proceeds a gradual destruction of tissues, which may be moderated so as hardly to be perceptible, or may be so intensified as to act almost like a cutting instrument." Speaking of the practical uses of sodium and potassium alcohols, the same writer says that he does not yet see the means of applying them internally, but predicts for them a very extended application for external purposes, they being most potent caustics—e. g., for the destruction and removal of malignant growths beyond the reach of the knife, by application to the surface, or by subcutaneous injection into the growths. Applied direct to the unbroken skin, their destructive action is less painful than would be expected, and when pain is felt it may be checked quickly by dropping upon the part a little chloroform, which decomposes the alcohol, converting it into a chloride salt and ether. Dr. Richardson had also found these alcohols to dissolve some of the vegetable alkaloids—e. g., opium; and thus a way may be opened to one of the greatest needs in medicine—a sure, rapid, and painless caustic. "The caustic alcohols may be used in combination with local anæsthesia from cold. A part rendered quite dead to pain, by freezing with ether spray, could be directly destroyed by the subcutaneous injection of caustic alcohol, a practice very important in the treatment of poisoned wounds, such as the wound from the bite of a snake, or a rabid dog. It is by no means improbable that some cystic tumours may be cured by the simple subcutaneous injection of a little of these fluids, after destruction of sensibility by cold. Potassium and sodium alcohol, added to the volatile hydride of amyl, dissolve in the hydride, and produce a caustic solution. When this solution is applied to the skin the evaporation of the hydride takes place, and a layer of the caustic substance is left behind. This application was of value to the surgeon." The author, continuing, said that, compared with the action of nitric acid, there was but little destruction of the epidermis, and he considered that the sodium ethylate acted as an astringent, and the pain was not so severe as that caused by the nitric acid. In his cases hardly any scarring ensued.

Dr Richardson expressed his deep satisfaction that one of the remedies he had introduced into practice in 1870 as the outcome of physiological research had proved so useful, and thanked Dr. Brunton for his recognition of the same. He referred to two cases of nævus, one of large size on the scalp, that he had successfully treated in 1870 by the application of sodium ethylate, and then pro-

ceeded to refer to the use of the ethylates in cases of scirrhus, and explained the strength of the solution that should be used, its mode of application, and the *rationale* of its action. The ethylates have not yet been administered internally, but they may prove of value, and, moreover, may clear up some difficult points in therapeutics ; for example, the action of potassium iodide, a salt which is readily decomposed ; and he rather inclined to the belief that the chief agent in the absorbent action of the salt was the liberated potassium, and not the iodine.

Mr. ADAMS said the objection to the knife is the subsequent cicatrization, for small scars may grow and become unsightly. He preferred a subcutaneous operation, and caustics had frequently failed in his hands. He asked Dr. Richardson how the ethylate acted. Was it by absorbing water, or by acting as an astringent ?

Dr. RICHARDSON replied that a chemical change takes place ; the ethylate takes up water from the tissues, re-forming alcohol ; the alcohol then coagulates all the albuminous compounds in its neighbourhood, and the soda liberated acts as a caustic, its action being limited by the coagulation caused by the alcohol. The red blood-corpuscles are also acted on, becoming disintegrated and rendered crystalline, while the white are for a time left unaffected. The risk of too great hemorrhage from the rapid action of the ethylate in cases of pendent vascular tumours, might be met by diluting the ethylate with alcohol, so as to promote coagulation.

Dr. BRUNTON stated that the ethylate has little or no action on the healthy skin, that it limits itself to the spot to which it is applied, and that it can be prepared most simply by adding sodium in small pieces to absolute alcohol.

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Encephalocele.

A very rare case has been described by MUHR, in the *Archiv für Psychiatrie*, in which the hernia cerebri presented beneath the nasal bones. During life it formed two tumours the size of walnuts, which lay on each side of the root of the nose, and extended against the nasal bones, at the inner and lower angles of the orbits. They were covered with wrinkled skin, and lessened on pressure, without any sign of cerebral disturbance. Pressure occasioned also a fine crepitation. The patient, who was forty-two years of age, had been epileptic from childhood, and for ten years had presented gradually increasing dementia. He died of phthisis. The frontal portion of each hemisphere was continued into a projection, inclosed in the dura mater, covered with the nasal bone, and separated from one another by the adhesion of the falx to the crista galli. These processes were covered with gray cortical substance, and resembled the olfactory lobes of certain animals. They contained, however, no prolongation of the lateral ventricle, and beneath them lay the optic tracts, apparently normal. On the basal surface of the left projection was a circumscribed area in which the pia mater was opaque and adherent. In the medullary layer of the peduncle of the process were irregular masses of gray substance, and also in the medullary layer of the frontal lobe, in front of the head of the nucleus caudatus. These contained peculiar cells, like those of the cerebral cortex. Otherwise the projection had the same structure as the adjacent part of the frontal lobe, and presented no resemblance to the olfactory lobe of animals. A peculiar degeneration of the large pyramidal nerve-cells was found in the precentral convolution, and in the frontal convolution of two other cases of mental disease the different stages of the changes in the cells were followed. First a pale ring appeared around the nucleus, due to the retraction of the protoplasm. This ring increased in size, while the protoplasm contracted into the processes of the cell, and finally the contour of the cell became less dis-

tinct, and only the nucleus remained. A portion of the cortex which had undergone this degeneration resembled closely the medullary substance; besides the undivided vessels only neuroglia and nuclei, in large pericellular spaces, could be seen. A careful description is also given of the bony skull in the case of encephalocele. The transverse diameter of the left orbit was considerably narrowed by the abnormal canal of the encephalocele, and the two nasal bones were completely fused. The bony canal of the encephalocele corresponded to the abnormally developed foramen cæcum. Ordinarily this foramen is occupied by a process of dura mater, which, according to Muhr, contains a large number of sympathetic nerves, and even sympathetic ganglia. It appeared, from careful measurements of the skull, that the deformity had not influenced the form of the rest of the cranium.—*Lancet*, Oct. 12, 1878.

Mimic Spasm of the Face cured by Stretching the Facial Nerve.

Dr. BAUM, of Danzig, describes a case of the above (*Berl. Klin. Wochenschrift*, No. 40, 1878). The patient, a lady, aged thirty-five, had nursed her husband in a long and fatal illness, towards the end of which she had three or four epileptiform seizures. Immediately after the last, twitchings of the left half of the face, spreading from the eyelids downwards, were noticed. They recurred every two or three minutes with such severity that, without causing pain, they affected the patient's rest, as well as her general health. No abnormality was found in any of the organs of the body, and all that could be made out was that, except the muscles of the ear, all the facial muscles supplied by the portio dura of the seventh nerve were involved. All treatment by drugs—iron and other tonics, narcotics, and iodide and bromide of potassium—failed, as well as that by electricity and "derivatives;" and, as a last resource, stretching the nerve-trunk itself was proposed. The operation was performed on July 20, 1878, nearly six years after the first symptoms of *tic convulsif* showed themselves. The nerve was reached by cutting down the upper border of the parotid gland with antiseptic precautions, and drawing the latter with hooks downwards, outwards, and forwards. The nerve was found of a dark-red colour, but not sensibly thickened. Dr. Baum seized it with a torsion forceps, and squeezed it with some force, at the same time drawing it from its bed. A few small arteries had to be tied before closing the wound. A temporary paralysis of the left half of the face, of half an hour's duration, followed the operation, but the twitchings did not return, nor had they returned at the time of the publication of the paper in October. Dr. Baum thinks the origin of the nerve-lesion may possibly be explained by some injury received during one of the epileptiform attacks above mentioned. That there was a local inflammation of the trunk of the facial nerve after leaving the stylo-mastoid foramen, is certain. He thinks that the rather rough treatment to which the exposed nerve was subjected was largely concerned in the successful result obtained; and that probably, from the comparatively small number of cases which have been published since Billroth and Nussbaum spoke in favour of nerve-stretching, there have been many failures from *too delicate* handling of the particular nerves experimented on.—*Med. Times and Gazette*, Nov. 30, 1878.

Watery Discharge from One Nostril.

At a late meeting of the Clinical Society of London (*Lancet*, Nov. 30, 1878), Sir JAMES PAGET read notes of a case of this. The fluid about two ounces, shown to the Society, had dropped from the left nostril of a lady, aged forty-nine, and Sir James stated that similar fluid has been dropping with rare intermissions for eighteen months. The fluid looked like pure water, or like that from the pia

mater, or that from an acephalocyst. There was no evidence of general ill-health, or any appearance of any kind of local disease of the nose. The history was nearly insignificant. In November, 1876, the patient had received a heavy blow over the left frontal sinus, but it seemed to have done no harm at the time. In January, 1877, she had one day of intense headache, but there had been no return of this. In February, 1877, she had a severe mental shock, and in May, 1877, the dropping began. From that time to the present the dropping continued, except for a fortnight in May, 1878, when she had bronchitis and took morphia, and on one occasion when it ceased for a night. A small drop fell or ran down the lip every few seconds, and about four ounces had been collected in an afternoon and evening. The quantity was generally uniform, but was increased by much exertion or by straining. On long standing the fluid deposited a minute quantity of a grayish substance, in which nothing could be found but the chance materials washed off from the surface of the nasal mucous membrane. Dr. Russell, Professor of Chemistry at St. Bartholomew's Hospital, reported the fluid to be slightly alkaline, and to contain proteid matter, probably albumen, chloride of sodium, phosphates, and a slight trace of iron, but no grape sugar. The specific gravity was 1004. Mr. Thomas Taylor had found the specific gravity on another occasion to be 1009 in one specimen and 1010 in a second, when he analyzed the fluid for Mr. Lawson, who had previously seen the case. [Mr. Taylor's analysis yielded similar results to that of Dr. Russell.] After suggesting several theories to explain the case, Sir James Paget concluded by expressing his opinion, though speaking with much doubt, that the fluid was derived either from a frontal or ethmoidal sinus, or from the subarachnoid space or the sac of the arachnoid membrane. He brought the case forward in the hope of hearing that similar cases had been observed, and that by collecting and comparing them we might gain some knowledge of their nature.

Mr. Brudenell Carter had met with a case of constant limpid narial discharge in an old gentleman eighty-four years of age, who was the subject of gout. The discharge lasted for several years, and was only temporarily relieved by remedies, such as tannin snuff, etc. In reply to Sir James Paget, Mr. Carter added that the discharge came from both nostrils.

Mr. Spencer Watson had met with two cases of chronic nasal catarrh, in which the fluid was perfectly limpid. In one of these it lasted for a year or more, was mostly from one nostril, and was occasionally purulent. It seemed to come from the anterior part, was of a clear limpid character, and flowed more readily when the head was lowered. In another case, that of a man aged eighty-four, the discharge was always from one nostril, and was also more abundant when the head was bent. No remedies checked the secretion, which he thought to be due to chronic catarrh of the antrum.

Mr. Lawson had had the present case under his care, and was struck with the similarity of the fluid to that flowing from the arachnoid of a boy after trephining. In the present case it was noticeable that very little escaped during sleep, which might be due either to less fluid being then secreted, or else that it dribbled down the pharynx and was swallowed.

Dr. Hewan had observed a somewhat similar discharge (but he believed of catarrhal nature) from the left nostril of a phthisical young man. It was arrested by hypophosphite of soda, but in six or eight months it recurred, when it was again treated with good results.

Dr. Althaus inquired whether the olfactory nerve was deranged. It was possible the discharge depended on some aberration of nerve-influence.

Sir James Paget, in reply, said that the sense of smell was unimpaired. The cases mentioned were of different nature to this, which did not depend on chronic

coryza or congested mucous membrane. The peculiarity lay in the fact that the discharge had dripped during the whole time from one nostril, in a simple continual stream, and never with any admixture of blood or pus. He must still leave the question of its nature open, whether it were cerebro-spinal fluid, or secretion from the ethmoidal or frontal sinuses. Any similar cases that may be recorded hereafter should contain an accurate statement of the amount and nature of the fluid.

New and Simple Method of Operating for Laryngeal Polypus.

This method (described by VOLTOLINI in the *Monatschrift für Ohrenheilkunde*, Nov. 3, 1878) consists in passing an ordinary sponge, attached to a somewhat flexible wire, into the larynx and drawing it to and fro. The sponge may be used dry, or previously moistened with water. The moment the sponge enters the larynx, the latter closes spasmodically. The sponge is then held there till the larynx dilates for an inspiration, at which moment the sponge is to be pushed on through the glottis and drawn upwards and downwards. When the polypus is situate above the vocal cords there is no necessity to wait, but the sponge is twisted round as soon as it has entered the larynx. In cases in which the epiglottis can be seen by drawing the tongue forwards and depressing it with a spatula, the laryngeal mirror may be dispensed with in introducing the sponge, for on applying the sponge to the posterior surface of the epiglottis it easily slips into the larynx. This method, at first recommended only for soft polypi, is, according to the author, also of service in the harder forms. In these cases the wiping out of the larynx is repeated after several days (from four to eight) till the polypus becomes livid, mortifies, and falls off.

In a later number of the same journal (Nov. 8, 1878) Professor Voltolini gives an account of a case operated on by this method by Dr. Ariza, of Madrid, and described by him in *El Anfiteatro anatomico espanol y el Pabellon medico*, May 31, 1878. This case was one of a woman, aged 28, with a dark-red polypus of the size of a pea, attached to the free border of the left vocal cord near its anterior part, and hanging down into the trachea. After having in vain tried to remove it with various instruments, and also having employed local anæsthesia without sufficiently overcoming the irritability of the larynx, Dr. Ariza had recourse to Voltolini's method. The sponge was applied for several successive days and produced some bleeding from the polypus. As the growth, however, did not diminish much in size, Dr Ariza endeavoured again to seize the polypus with a snare, and succeeded in tearing off a portion of it. After three or four more sittings, in which the sponge was used, the growth diminished rapidly in size, finally became violet or black-coloured, and on the following day had disappeared entirely. Dr. Ariza considers that this operation is not in the least degree dangerous to the patient, and it can be performed by any surgeon who is not a specialist, and that it is the only operation which can be employed in those frequently occurring cases in which there is absolute intolerance of the larynx. Professor Voltolini thinks that in the above case the operation might have been completed without the use of the snare, and cautions against endeavouring to tear off hard polypi by the sponge method. As above mentioned, it suffices in these cases to bruise and lacerate the polypus in order that it may mortify and fall off.—*London Med. Record*, Nov. 15, 1878.

Thyrotomy for the Removal of a Membrane Completely Obliterating the Larynx.

At a late meeting of the Royal Medical and Chirurgical Society (*Lancet*, Nov. 30, 1878) Dr. FELIX SÉMON read a paper on a case of this. The patient had

attempted to cut his throat, and as the wound healed, it was found necessary to perform tracheotomy. The voice gradually became diminished, and laryngoscopically a tough dense membrane was found occluding the larynx between the false vocal cords, with evidence of anchylosis of the left arytenoid cartilage. The operation was undertaken to remove this membrane, and was the third case on record in which thyrotomy had been practised for such a purpose. A modification of Trendelenberg's tampon was employed to plug the trachea. The author urged great caution in the administration of chloroform through the tampon-canula, the liability to asphyxia being greater than when inhaled in the ordinary way. In the operation itself he had intended to only partially divide the thyroid cartilage, leaving its upper part uninjured, so as to insure subsequent apposition of the parts, but he was compelled to fully divide it. He then found that there was a second membrane in the larynx, at the level of the original suicidal wound, that visible with the laryngoscope being probably due to the adhesion of the false vocal cords. He urged, therefore, in similar cases, an examination through the tracheotomy wound, to ascertain the presence of other membranes. The lower and primary membrane was being excised with a pair of curved scissors, when the patient began to cough violently. It was thought that the tampon-canula did not sufficiently occlude the larynx, and that perhaps blood entered the bronchi. In reinflating the tampon the cough was replaced by an intense asthmatic paroxysm marked by extreme inspiratory dyspnœa. No obstruction was found in the tube, but on partial evacuation of the tampon-bag, the dyspnœa ceased, showing the author held, that an excess even of equal pressure on the inner walls of the trachea sufficed to produce reflex spasm. The sudden cough was in corroboration of Stoerck's statement that the posterior wall of the larynx, and especially the interarytenoid fold, excite cough when touched, whilst the anterior and lateral walls of the larynx are not so irritable. The wound healed by primary union, but in spite of daily repeated and long-continued passage of bougies through the mouth, there was gradual cicatricial stenosis of the larynx, and a month after the operation no air passed through the mouth.

Dr. Sémon felt sure there was no narrowing of the trachea, for he was able to explore it thoroughly with a goose-quill, and although the dyspnœa was both expiratory and inspiratory, it was chiefly the latter; but he believed it produced by reflex action from pressure on the nerves supplying the mucous membrane, and thought this borne out by some experiments which had been made.

Mr. HOLMES had had but small experience in thyrotomy, but he had seen no need to employ sutures, and criticized the procedure suggested by Dr. Sémon, of not completing the division of the cartilage, as diminishing the area for manipulation, and preventing the complete exposure of the ventricular bands. Dr. Sémon explained that one object he had in view was to preserve the anterior commissure of the vocal cords, and thus prevent that total loss of voice which Bruns had shown to follow after complete thyrotomy.

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Pistol Shot through Right Ventricle, Septum, and Aorta: Ball lying in Left Ventricle; Sudden Death on fifty-fifth day.

Dr. V. P. GIBNEY, at a late meeting of the New York Pathological Society (*Med. Record*, Dec. 14, 1878) presented this very interesting specimen, on behalf of Dr. F. M. Holly, of Greenwich, Conn. The following notes accompanied the specimen :—

"A. J., æt. 18 years, farm-hand, was on the 7th day of July, 1878, accidentally shot by a companion with a small Smith & Wesson revolver, calibre $\frac{22}{100}$ inch. When seen by his attending physician, Dr. Mead, about an hour after the acci-

dent, he was in a state of partial collapse, the result of shock. He had no remembrance of the shooting, or of having fallen into the brook near which he was sitting at the time. He rallied rapidly without cough or expectoration, or any unfavourable symptoms other than slight dyspnœa, accompanied with pleuritic stitch on both sides for a few days. In less than a fortnight was again at work apparently well.

" He continued in good health, performing the ordinary labour of a farm hand without inconvenience, until the morning of August 30th, when, after a full breakfast, he went into the field, and was found about twenty minutes afterward dead behind the plough. *Autopsy* twenty-four hours after death ; usual post-mortem signs present. A small cicatrix near left nipple one and three-quarters of an inch above, and toward median line. On opening thorax, the left pleura and the pericardium were found distended with serum and coagula. A small cicatrix could be seen on the anterior border of the upper lobe of left lung in a line with the external cicatrix, and under this was found an opening of one-quarter inch diameter in the pericardium. The lung was adherent, by firm bands of organized lymph in the immediate neighbourhood of the cicatrix, to the costal pleura and pericardium. Opposed to the opening in the latter, in the upper anterior margin of right ventricle, was found a small aneurismal sac of the capacity of not more than one drachm, the walls of which were very attenuated. This was ruptured, and a probe passed through the opening entered the ventricular cavity. The effusion into the chest was accounted for by this opening in the pericardium. A careful search failed to discover the ball.''

In presenting the specimen Dr. Gibney made the following remarks : When I received the specimen, I opened the left ventricle, and found a small ball lying behind one of the pillars of the columnæ carneæ a little above, and to the left of the apex of the cavity. A delicate membrane covered the ball, and I left it just as it now can be seen in the specimen. On a more careful examination, an opening was traced through the upper portion of the septum, through the semi-lunar valve, lying against the septum, through the aorta itself to the left auricle. All these openings were found on a line with the opening into the right ventricle. The conclusion, then, seems to be irresistible, that the ball must have encountered a well-filled left auricle, been spent, and easily arrested, and have dropped down through the auriculo-ventricular opening, and have been lodged about its present site.

The sac on outer side of heart seems to be the parietal layer of the pericardium, and must have been formed by the blood forced out at the impulses of the heart. If this can then be properly called an aneurism, it is a dissecting aneurism. The wound through the right ventricle must have been valvular, and the pericardium here quickly healing prevented the escape of blood. This finally rupturing from over-distension, in all probability caused death.

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New Operation for Phimosis.

Being struck by the inconvenience of the ordinary bleeding operation, M. Jude Hue (*Le Progrès Médical*) has proposed a section of the prepuce in the median line and on the dorsal surface, by means of the elastic ligature. For this purpose a needle, threaded with an elastic band, is passed between the prepuce and the gland until the bottom of the *cul-de-sac* is reached. The prepuce is then trans-fixed, and two ends of the elastic are knotted at the free border of the prepuce. In ten days or a fortnight the ligature comes away and the operation is complete. M. Horteloup had invited M. Hue to operate upon patients in his hospital, and the results at first were not encouraging, as a good deal of pain resulted for 24 or

48 hours. When the patients were seen three months afterwards, the results were found to be very satisfactory, so that M. Horteloup recommends this simple method in cases of phimosis without hypertrophy of the prepuce, and where there is no inflammation or thickening of the integument, and he thinks this plan will be found of great service in children.—*London Med. Record*, Nov. 15, 1878.

Mechanism of Orchitis.

In a recent paper on the mechanism of recurrent orchitis, and inflammatory orchitis generally, M. Despres arrives at the following conclusions: 1. Recurring orchitis and inflammatory orchitis are both due to the retention of semen in the testicle. 2. The cause of this retention is not always situated at the same point, but it is more than probable that swelling of the mucous membrane of the ejaculatory ducts and vas deferens, or of the lining membrane of these canals at the periphery in the prostate, or of the mucous membrane of the urethra, is the ordinary cause of retention of the semen. 3. The rarity of suppuration in cases of orchitis allows these inflammations to be designated seminal engorgement of the testicle, in the same way that the retention of milk in the mammæ has been called lacteal engorgement. 4. The appearance of orchitis on from the tenth to the twentieth day of gonorrhœa, is in accordance with the functional activity of the testis; those patients with an actively exercised organ should develop orchitis towards the end of the urethritis. 5. The orchitis occurring during convalescence from gonorrhœa is not produced by the same mechanism as those following an injury. 6. Orchitis due to a wound, or to some urethral irritation, can be explained by swelling of the affected parts, particularly on a level with the ejaculatory ducts and vesiculæ seminales, which rapidly prevents the flow of semen into its reservoir, the vesiculæ seminales.—*London Med. Record*, Nov. 15, 1878.

Sarcoma of the Male Breast.

Dr. D'Ambrosis relates the following case in the *Annali Clinici dell' Ospedale degli Incurabili*, 1878 (*La Medicina Contemporanea*, August, 1878). In 1873, a man aged 30 came under his care. In the centre of his left breast, in the situation of the nipple, was a fungoid tumour, apparently divided into two lobes by a narrow fossa; it was entirely destitute of skin, which formed a somewhat raised and hard ring at its base. The base of the tumour was rather wide, but it appeared to be quite movable on the subjacent tissues, and free from all attachment to the ribs. It was 7 centimetres (2.8 inches) in height; its greatest circumference was 12 centimetres (4.8 inches), and that of the base 6 centimetres. Its surface was studded with large granules; and to the touch it had a firm elastic consistence. The patient was constantly troubled with lancinating pains; the glands had not undergone the least change; his general appearance was healthy. The growth had commenced eight months previously without known cause; there was no hereditary predisposition. The tumour was removed, and the patient was soon afterwards discharged cured. It was diagnosed to be a spindle-celled sarcoma; and this was confirmed by microscopic examination.—*London Med. Record*, Nov. 15, 1878.

Sarcoma of the Palm of the Hand.

At a recent meeting of the Société de Chirurgie (*La France Méd.*, 1878, p. 253), M. Tillaux read a communication from Dr. Gross, of Nancy, giving an account of a peculiar growth which he had recently removed from the palm of the hand. The tumour was developed in the subcutaneous cellular-adipose tissue.

The patient, a girl aged seventeen, had a tumour at the root of the right index finger, occupying the place of the adipose cushion usually situated there; it extended thence to the thenar eminence and the palm of the hand, forming a lower subcutaneous lobe and an upper lobe somewhat flattened by the aponeurosis. The tumour was painless, movable, and did not adhere to the deeper tissues. M. Gross hesitated in his diagnosis between lipoma and sarcoma. Microscopic examination of a piece of the tumour showed the presence of the latter. The tumour was removed by enucleation. Four or five days later an isolated process was observed in the wound, which gave rise to fears of a return of the disease. This was destroyed by caustic, and subsequently returned twice, finally disappearing entirely under the use of Canquoin's paste.

In the discussion which followed, M. Verneuil said he had long warned his pupil against the danger run in enucleating so-called "benign" tumour. Frequently the examination of a rounded encysted fibro-plastic tumour would show a sort of serous sac about the periphery, a very loose cellular tissue. Enucleation is easily effected, but on examination of the cyst which surrounds the tumour it is found to be composed entirely of fibro-plastic elements. In these cases local relapses of the most stubborn character are to be feared. M. Verneuil was accustomed in such cases, as in fibromata of the mamma, often mistaken for adenomata, to remove the whole cellular "atmosphere" about the tumour, going into the healthy tissue beyond the suspected zone. M. Desprès said he thought the growth in M. Gross's case was connected with the bone.—*London Med. Record*, Oct. 15, 1878.

Resection of the Wrist.

In some remarks on a successful case of resection of the wrist (*Bulletins et Mémoires de la Société de Chirurgie de Paris*, tome iv.), M. J. L. REVERDIN points out that the object of this operation is the conservation of an organ of tactile sensibility as well as of movement. In almost all instances resection of the wrist has been performed in the treatment either of white swelling of this joint, of penetrating wounds with or without fracture, or of arthritis occurring immediately or remotely as a result of such injury. In each of these instances, however, the operation is performed under unfavourable circumstances. The subject of white swelling is usually a scrofulous individual in a bad state of health, and debilitated by long-continued suppuration; there is always a risk of a return of the local disease, and the good results of a successful operation may be compromised or destroyed through the development of some visceral affection. It should be remembered, however, that even under the unfavourable conditions that attend white swelling, good results have been obtained from excision of the wrist by Lister and other surgeons. This operation has not given very brilliant results when applied in military surgery and in the treatment of injuries to the joint. In ten cases collected by Langenbeck in which the operation was performed after gunshot wound, two patients died and eight recovered. In two of the eight successful cases there was ankylosis, in one there was a very movable false-joint, and in each of the five remaining instances the hand remained quite useless. Of five cases reported by Dr. Otis, of total resection of the wrist performed during the American war, two only were successful; in three instances the hand could not be used, and in one it was necessary, in consequence of secondary hemorrhage, to amputate the hand. The case recorded by M. Reverdin was one of suppurative arthritis by propagation. There was no fracture, and no traumatic disturbance of the peri-articular soft parts. The patient, a male aged 41, was quite free from any scrofulous taint, and about the affected joint there had been some

inflammatory action capable, according to Ollier, of renewing in the periosteum regenerative properties that in adult life usually remain latent.   The disorders in the peri-articular structures had been those merely of a simple inflammatory nature.   This case, taken with two others, one reported by Lister, the other by West of Birmingham, seem, according to M. Reverdin, to indicate that in acute suppurative arthritis of the wrist the surgeon may fairly expect, notwithstanding the inflammatory complications, to preserve, through resection, a very serviceable hand.   M. Reverdin in this case performed Lister's operation.   In consequence of much swelling and induration of the parts around the wrist-joint, the proceedings were attended with difficulty, and the swollen structures were at some points torn and contused.   It is pointed out that ablation of the bones of the carpus demands much patience on the part of the operator, and that it must always be a long and laborious if not difficult proceeding.   The author is disposed to recommend, in order to facilitate the operation, freer exposure of the diseased bone through division of the extensor tendons.   He holds that under present conditions of antiseptic surgery we may expect to attain union of tendinous and other soft parts by primary intention.   The division of one or more of the extensor tendons during the operation of excision of the wrist is, it is argued, less likely to result in harm than the denudation of such structures along a considerable extent, or than the contusion and laceration caused by forcibly stretching them to one or the other side.   Excision also is recommended of a small portion of each divided extensor tendon, when a portion of the skeleton of a limb has been removed. Unless extensive osseous regeneration take place, the tendons become too long and the muscles cannot act with proper efficiency.   That sufficient regeneration of the bones can take place after resection of the wrist is impossible ; and there-fore, until the extensor muscles or their tendons undergo shortening, the fingers cannot be well extended.   It would not be necessary, it is held, to divide any of the tendons in front of the wrist; for, in consequence of the shortening of the extensor tendons the fingers could be drawn backwards, and so placed in the most favourable condition for the efficient action of the relatively elongated flexor tendons.—*London Med. Record*, Oct. 15, 1878.

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Wounds of the Chest with Prolapse of the Lung.

A. Völkel (*Berliner Klin. Wochenschrift*, No. 7, 1878) relates the following case : A young man, aged 20, was stabbed in the left axillary line in the eighth intercostal space.   When Dr. Völkel saw him, some hours afterwards, the open-ing was closed by a hernia of the lung as large as a pigeon's egg.   It was stated that at first air passed in and out of the wound, and that this was followed by much hemorrhage ; this was confirmed by the presence of a rather considerable pneumothorax on the left side, and by dulness of the percussion-sound from the base of the left chest upward.   Reduction being prevented by the tight nipping of the neck of the prolapsed portion, iced compresses were applied.   At the end of three days the fever had disappeared.   Fourteen days after the injury, the air and blood in the left chest were almost absorbed, and the patient felt well.   For some days the hernia of the lung was somewhat increased, in consequence of the paroxysms of cough ; it did not, however, slough, but soon became covered with abundant granulations, and gradually contracted, so that healing was complete at the end of five weeks.   The author points out the analogy between the course of this case and that of unreduced omental hernia.—*British Medical Journal*, Nov. 9, 1878.

Osteogenous Sarcoma in Children.

In the *Jahrbuch für Kinderheilkunde*, Band xii., W. Ost relates some cases of sarcoma of bone which he has observed in children. The subject of the first case was a girl aged 9, who had a round-celled and spindle-celled periosteal sarcoma involving the lower and middle thirds of the left femur. The second case was also one of periosteal tumour as large as a child's head, involving the upper tibial epiphysis of a boy aged 6¾. In neither case could any cause be ascertained. In the third case, one of sarcoma of the nasal bones and upper jaw, the origin of the tumour was attributed to a blow with a hammer, which the patient, a child four years old, had received a month before the time when the tumour, then the size of a walnut, was first recognized. Extirpation of the tumour was followed by obstinate returns, and the child died of general infection. To these cases, Ost adds forty others of which he has found records. Of thirty-two cases of periosteal tumour, the bones of the skull were affected in eight cases, the jaws in ten, the clavicle in one, the humerus in two, the metacarpus in one, the spinal column in one, the pelvic bones in two, the femur in four, the tibia in two, the fibula in one.—*British Medical Journal*, Nov. 9, 1878.

OPHTHALMOLOGY AND OTOLOGY.

Ergotine in Acute Ophthalmia.

Dr. Planat, of Nice, has found (*Journ. de Thérap.*, Oct. 25) ergotine act with efficacy and promptitude in proportion as oculo-palpebral phlegmasiæ are simply inflammatory. In blepharo-conjunctivitis the improvement is first observed in the conjunctiva; and in keratitis, although still very active, it is a degree less so than in the more superficial affections. It is also of great service in iritis, rapidly subduing the acute manifestations and preventing their extension to the external membranes of the eye. When these last are the seat of a chronic fluxion dependent on a scrofulous or dartrous diathesis, ergotine, without influencing the constitutional affection, acts none the less efficiently on the inflammatory element—a fact of importance, as by generally preserving the eye from plastic deposits, corneal ulcers, and consecutive staphylomas, it allows of the treatment for the diathesis being more promptly put into force. The formula which Dr. Planat recommends is from one to one and a half gramme of ergotine in twenty of glycerine or rose-water, of which from eight to ten drops are to be inserted in the eye every two hours. Where there is violent inflammation of the eyelids or distension of the conjunctiva, a rag wetted in this mixture should be left on the parts for some hours. In general, two or three days suffice for the subdual of the most intense blepharo-conjunctivitis. Dr. Planat has employed the ergotine in this way, with invariable success, for several years past.—*Med. Times and Gazette*, Nov. 2, 1878.

The Pathology of Glaucoma.

In a communication read at the meeting of the Italian Ophthalmological Association in September, 1877 (*Annali di Ottalmologia*, Anno vii, Fasc. I), Professor Del Monte described the appearances found in a glaucomatous right eye which he had removed from a lady aged 65. She had undergone iridectomy in

the left eye on account of commencing glaucoma, and the right eye was removed in consequence of the persistence of pain in it.

A microscopic examination made after the two halves of the eye had been preserved twenty days in alcohol, presented the following appearances. The ciliary processes were very small, their tissue having a fibrous aspect, with scattered cellular elements ; and above their pigment the ciliary portion of the retina was observed to be adherent. The ciliary muscle was very slender ; there was no trace of the canal of Schlemm, and the iris was adherent for a considerable extent to the inner surface of the cornea. On the anterior surface of the iris a small streak of newly-formed connective tissue was observed. The author called attention to a layer of connective tissue interposed between the epithelium and Bowman's membrane ; the latter had disappeared from part of the periphery of the cornea, leaving only the connective tissue. The author believed that he was the first to observe this change ; if it had not been described by others, it was probably because the attention of ophthalmologists had been principally directed towards the intra-ocular extremity of the optic nerve, the retina, and the ciliary processes.

Dr. Del Monte reviewed the opinions held as to the pathology of glaucoma, and expressed his belief that the increase of intra-ocular pressure is not due to accumulation of aqueous humour or of fluids which should escape from the eye ; since clinical experience proves that the occlusion of the channels of diffusion proceeds *pari passu* with a diminution in the production of the fluids. The slow reformation of the anterior chamber after iridectomy, especially in chronic glaucoma, sufficiently proved this.

From an anatomo-pathological point of view, the author said, it is demonstrated that in glaucoma there is a slow process of sclerosis of the anterior uveal tract and of the cornea ; and this can only be the result of stasis, as in analogous lesions of other parts of the body. The author believed that the stasis, which is the primary condition of glaucoma, is in the lymphatics rather than in the blood-vessels ; since, in cases of vaso-motor paralysis in which there is retarded circulation, the intra-ocular pressure is diminished rather than increased.—*Lond. Med. Record*, Oct. 15, 1878.

MIDWIFERY AND GYNÆCOLOGY.

On Indefinitely Prolonged Uterine Pregnancy.

In an inaugural thesis of much merit, Dr. MÜLLER, of Nancy, discusses the question whether the retention of the embryo in the uterus far beyond the period of pregnancy is possible ; in other words, whether the cases of so-called "missed labour" have a claim to be believed. He has collected all the known cases in literature, and has subjected them to a critical examination ; and the result at which he arrives is, that not a single case of so-called uterine retention of the fœtus is to be regarded as such, but is to be explained in some other way, and that most of these cases are instances of extra-uterine pregnancy. In previous centuries, many cases of retention of the embryo in the uterus have been described. Where sufficient descriptions have been given, the author has found it easy to explain the cases by extra-uterine pregnancy. When the fact that the embryo was capable of development outside the uterus became known to obstetricians, the number of cases of retention of the embryo in the uterus remarkably

diminished. In this respect, a hitherto unpublished case which occurred to Stolzt is of much interest.

A woman, aged 33, who had had one easy labour in November, 1830, felt herself again pregnant, and at the same time suffered from symptoms of peritonitis, which did not entirely disappear during the whole period of pregnancy. Towards the end of pregnancy she had fever. The pain became intolerable, especially when the child moved. At the end of September, 1831, pains like those of labour set in. A medical man endeavoured to apply the forceps, but failed; he then attempted to turn, and, not succeeding in this also, he withdrew. A second surgeon who was called acted on the expectant plan. In the mean time the pains ceased, the woman felt no further movements of the fœtus, and an abundant secretion of milk set in. At the end of December there was a discharge of blood, which recurred at the same time in February, March, and April, 1832. In May a new attempt at delivery was made, and as the contraction of the os uteri could not be overcome, large doses of ergot were given. After this the patient became rapidly worse, and died at the end of June. On *post-mortem* examination a large tumour was found, intimately adherent to the intestine, and containing the fœtus. No one doubted that this was the uterus, and the case was diagnosed as one of retention of the fœtus in the uterus. Some time later Stoltz made a more accurate examination of the tumour, and succeeded in detaching a uterus 7 centimetres long, with its appendages.

Müller does not deny that the so-called missed labour may occur in animals, but does not consider it justifiable to draw any conclusion therefrom with regard to the human female, whose uterus has quite a different form from the *uterus bicornis* of animals. In recent French literature, there is not a single trustworthy case of uterine retention. The case of Camerarius, cited by Schröder, is identical with the so-called stone-child (lithopædion) of Leinzell. Freund's case is regarded by the author as one of abdominal pregnancy; and an examination of the cases recorded by Mühlbeck, Liebmann, and other authors, English and foreign, leads to the same results. The author considers "missed labour" as the attempt at parturition at the end of extra-uterine pregnancy, which soon again passes off, and may be followed by retention of the fœtus for many years and its calcification.—*London Med. Record*, Nov. 15, 1878.

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Ovarian Pregnancy.

In the *Annales de Gynécologie* for July, 1878, Dr. ALBERT PUECH, after quoting six cases of ovarian pregnancy, draws from them the following conclusions. 1. Ovarian pregnancy takes place, but up to the present time it has been rarely observed. 2. Most of the cases described under the heading of ovarian pregnancy have been dermoid cysts, ovario-tubal pregnancies, or abdominal pregnancies in which the placenta has become attached to the ovary. 3. The anatomical conditions found in an ovarian pregnancy are: *a.* Absence of the corresponding ovary; *b.* Union of the fœtal sac to the womb by the ligament of the ovary; *c.* Presence of ovarian structures in the walls of the sac; *d.* Independence of the Fallopian tube as regards the formation of the fœtal sac. 4. There are two varieties, according as the fœtus is developed in the vesicle which has remained open, or in a vesicle which has closed immediately after fecundation. 5. The progress and termination of ovarian pregnancy do not materially differ from those of abdominal pregnancies. 6. Laparotomy is the only rational treatment when the pregnancy has arrived at term.—*Lond. Med. Record*, Oct. 15, 1878.

A Case of Labour Complicated with Occluded Double Vagina: Face Presentation ; Craniotomy.

Dr. James Arthur Rigby reports (*Lancet*, Nov. 16, 1878) the following interesting case.

Mrs. W——, aged thirty-one years, pregnant. On examination there was at first a total inability to find any evidence of a vaginal orifice, but eventually one was found along which the finger could be forced, and at the extremity of which the tip of the finger impinged upon a hard body; the finger was tightly constricted in all its length by the walls of the canal, so as to render it quite impossible to make a more effectual vaginal examination. On external examination, the pudendæ were seen to be swollen, and only the faintest trace of a vaginal orifice could be made out. The forcible examination caused considerable hemorrhage.

The first question was whether the woman was pregnant or not. This was decided in the affirmative on the following grounds: Her regularity of menstruation before marriage. The fact that menstruation ceased almost immediately after marriage. Quickening occurred about the normal time. She had felt vigorous movements of the child up to the very time of my visit. The breasts exhibited the usual signs of pregnancy. The fœtus could be made out lying obliquely, with the head in the right iliac region, while its inferior parts were directed upwards towards the left lumbar region. A dense hard body, presumably the fœtal head, as has been stated, could be felt with the tip of the finger at the upper extremity of the vagina. Finally and conclusively, the fœtal heart-sounds could be heard distinctly a little below and to the right of the umbilicus.

The signs of pregnancy, then, were complete, notwithstanding the apparent improbability of impregnation having been able to be effected under such adverse circumstances. On reviewing the case, it was thought best to postpone all operative proceedings till the advent of labour, so as to have the advantage of the natural relaxation and dilatability of the parts during that time.

Two days after my first visit the woman commenced in labour. On our arrival, we found that the pains came on at tolerably regular intervals. Examination revealed that the vaginal canal was slightly more dilated than it had been at the first visit, though still rather difficult to find. No signs of the os uteri could be made out. Each examination caused the woman to bleed a little. After waiting a short time, it was deemed advisable to introduce the smallest of Barnes's water-bags; this was effected with some difficulty, and at the end of an hour one of the larger bags was introduced. On taking this out we were very much astonished and gratified at the result. The vaginal canal was now dilated to almost its normal calibre; at its upper extremity the os uteri could be felt, thin and somewhat rigid, but dilated to the extent of about two inches in diameter, while the distended membranes were projecting through it. The head was presenting. The vagina, however, could now be felt to be divided into two parts by a distinct septum running in an antero-posterior direction, the upper of which parts was in connection with the dilating os uteri, while the lower formed a cul-de-sac, in which nothing could definitely be made out. The os uteri dilated rapidly, and the membranes soon after ruptured, when it was discovered that it was a face presentation, mento-posterior. The long forceps were now applied, but, in consequence of the pubic arch being narrow, and the nature of the presentation, it was found utterly impossible to deliver with them, and craniotomy was reluctantly resorted to. The patient was delivered within four hours of the first application of the water-bags.

Remarks.—The great interest in this case lies first in the fact of impregnation occurring under such adverse circumstances, there being absolute proof that there had never been any penetration of the male organ; indeed, there was the greatest

difficulty in introducing the finger, and that was accompanied by considerable bleeding. This, then, from a medico-legal point of view, distinctly proves that no degree of penetration is necessary for impregnation, and that the wandering spermatozoa must have found their way from the outside of the body, along an extremely narrow vagina, and so into the uterus.

The next point for consideration is the satisfactory manner in which the water-bags acted. They caused little or no expressions of pain, while they rapidly opened out the whole of the vaginal canal. Before their application all was chaos, afterwards order reigned supreme. We were prepared for a combined action of slight incisions with forcible dilatations, but these were rendered quite unnecessary on the application of the water pressure. It appears to me that in the above case the walls of the vagina were simply most rigidly contracted, and its cavity was further encroached upon by the membranous septum referred to. Doubtless the cavity of the uterus was also divided into two parts, one of which only was tenanted.

In conclusion, I may state that, notwithstanding the very untoward appearance of the case at first, very little doubt exists in my mind that, had it been an ordinary vertex presentation, delivery might have been effected by means of the long forceps, and so a living child born.

The patient made a good recovery.

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The Treatment of Pregnancy complicated with Cancerous Disease of the Genital Canal.

At a late meeting of the Obstetrical Society of London (*Med. Times and Gazette*, Oct. 19, 1878), Dr. HERMAN read a paper on this subject. He first narrated two cases which had come under his own care. In one, labour was obstructed by a cancerous tumour of the rectum. The patient was delivered by cephalotripsy, and died from peritonitis. In the other the cervix uteri was fixed by cancerous disease; abortion was induced at the end of the fifth month; the patient lived seven months afterwards, marked relief to the symptoms having followed the abortion. Then followed an analysis of 180 recorded cases, collected from different sources, and classified. From them he drew the following conclusions: 1. That whatever influence cancer of the uterus may have upon conception is adverse to its occurrence. This was inferred from the small number of cases in which the patient was suffering from cancer at the time conception took place, as compared with the frequency of the disease. 2. That cancer of the uterus tends to produce the intra-uterine death and premature expulsion of the fœtus. This conclusion followed from the large proportion of premature births, and of not only still-born, but decomposing children. 3. That the growth of cancer of the uterus is, as a rule, accelerated during pregnancy. This was supported by *à priori* arguments from general pathology, by the analogy of the breast, and by the improvement which often followed the termination of the pregnancy. 4. That with cancerous disease affecting the whole circumference of the os uteri, labour may be quick and easy, and the patient may recover well and live for months afterwards. 5. That when delivery under such conditions is accomplished by natural efforts, expansion of the cervix usually takes place by fissuring. 6. That this fissuring does not usually augment the risk to the mother. 7. That imitation of this natural process, by making incisions, neither increases the danger at the time nor accelerates the progress of the disease subsequently, and that it often greatly facilitates delivery. 8. That the cases in which the cancer forms a tumour of great size or hardness are the ones in which delivery by natural efforts will not take place. 9. That where the above characters are absent no definite criteria can be drawn from the local

conditions by which to foretell the behaviour of the os uteri during labour. 10. That where delivery of a living child *per vias naturales* is impossible, such limited experience as we have shows that there is but little difference, as to the risk to the mother, between craniotomy and Cæsarean section. 11. That a part of the cervix uteri may with safety be removed, either during pregnancy or during labour. These last eight conclusions were supported by the evidence of recorded cases. The author then considered from these data the practice to be followed. He assumed that the life of the mother was the first consideration, and that the production of abortion was justifiable if maternal life could be saved or prolonged thereby. The following were the rules of practice which he thought indicated— 1. That where it is possible to remove the disease, either during pregnancy or at the time of labour, it ought to be done. 2. That where this cannot be done the safety of the mother is best consulted by bringing the pregnancy to an end as soon as possible. 3. That when labour has actually come on, expansion of the os uteri should be added by making numerous small incisions in its circumference. 4. That dilatation of the cervix uteri being in progress, if uterine action should be deficient, and it should become necessary to accelerate labour, the use of the forceps is, as a rule, better than turning. 5. That when dilatation of the cervix cannot take place, even after incisions have been made, either from rigidity or magnitude of the tumour, Cæsarean section should be performed.

Laparo-Elytrotomy.

This operation has recently been performed in England on two cases, with fatal results of the mother, but successfully to the children. Dr. HIME, who operated on the first case (*Lancet*, Nov. 9), adds, in conclusion, "considering the easy nature of this operation, the certainty of saving the child, and the strong probability of saving the mother, it is a question how far craniotomy will ever again be justifiable, and whether Cæsarean section should not drop into oblivion." In the other case operated upon by Dr. EDIS (*British Med. Journal*, Nov. 20, 1878), the bladder was opened. The case was an unsatisfactory subject for operation, and it is believed that the issue would have been the same if Cæsarean section or cephalotripsy had been performed.

Oxalate of Soda in Metritis.

Dr. GATTI (*Rivista Clinica di Bologna*, Nov. 3, 1878) alleges that he has obtained excellent results from the employment of oxalate of soda in metritis and puerperal metro-peritonitis. He gives it in daily doses of 89 centigrammes (12½ grains) in 125 grammes of mucilage. Lange has already spoken favourably of this remedy, not only in metritis but also in puerperal infection. Gaspari, on the other hand, denies that it possesses any antiseptic property.—*London Med. Record*, Nov. 15, 1878.

Total Extirpation of the Uterus.

Recently, Professor FREUND of Breslau has performed this operation in two cases of carcinoma, on patients whose ages were sixty-two and fifty years respectively, and his method is described at full length by himself in *Volkmann's Sammlung Klinischer Vorträge*, No. 133, and in the *Centralblatt für Gynäkologie*, 1878, No. 12; and the details of his second case, to which we shall here chiefly refer, are given by his assistant, Dr. Fränkel, in the *Berliner Klinische Wochenschrift*, No. 31, 1878. Both operations were successful, although long and tedious; the second lasted two hours and a half. The antiseptic method was strictly followed, except that the spray was not allowed to enter the abdominal cavity. Dr. Fränkel, however, states that if a half per cent. spray instead

of the usual two per cent. is used, it answers equally well, and does not irritate the peritoneum, besides being much pleasanter to the operator's hands. The following is an outline of the method adopted, but we do not pretend to enter into such details as must be known by any one who attempts the operation for the first time. Previous performance of all its steps on the dead body is essential. The patient is prepared by a course of warm baths, a special nutritive and highly digestible dietary, and a trustworthy aperient, which is given twelve hours before the operation. The uterus is disinfected at the time of the operation with 10 per cent. carbolic acid, and, the patient lying with her head lower than her pelvis, an incision is made in the linea alba, a ligature is passed through the peritoneum of the anterior part of the pelvis to prevent its collapse, and the intestines filling the pelvis and covering the uterus are raised, pulled upwards, and held wrapped in a soft linen cloth soaked in warm carbolic acid solution until the operation is finished. This usage has no ill effect on the bowel, and Dr. Fränkel remarks that at the end of the second operation it was not in any way altered in appearance. To control the movements of the fundus uteri a thread is passed through it and held by an assistant. The broad ligaments of either side are now ligatured in three portions. "The upper ligature transfixes the Fallopian tube and the ligamentum ovarii; the middle one passes through the ligamentum ovarii side by side with the upper ligature, and returns through the round ligament; and the lower pierces the round ligament, and is carried twice through the vaginal wall— first through the antero-lateral part of the vaginal roof into the vagina, and then back through the postero-lateral part of the vaginal *cul-de-sac* behind the base of the lateral ligament into Douglas's pouch." The uterus is then removed through the roof of the true pelvis, the incision commencing in front, "two centimetres above the limits of the bladder, as marked by the point of a male catheter in that viscus, and running with a bend from the lower ligatures up to the broad ligaments, and then to the back of the uterus, two to three centimetres above the deepest point of the pouch of Douglas." In the second operation the bleeding from a few small branches of the right uterine and vaginal arteries was difficult to check, and nearly three-quarters of an hour were consumed in doing it. For future operations Professor Freund has devised an improved serre-fine to control the vessels.

After drawing the ends of the ligatures into the vagina, the peritoneal opening is closed, and the abdominal incision, after replacement of the intestines, is brought together in the usual way; a firm antiseptic bandage is applied, and all the precautions usual after ovariotomy observed.

In the second case there was *absolutely no* after-reaction, and the highest temperature reached was 38.2° Cent. (100.7° Fahr.) on the second day, while the pulse never exceeded 84. The patient left her bed on the fourteenth day, and she is now, like the first patient whose uterus Professor Freund removed, fatter than previously, and able to work hard *in the fields*.

Thus far, thanks probably to Lister's method, the new attempts at removal of the whole uterus have perfectly succeeded. Whether the cancer will relapse or not, can, as Professor Freund says, only be decided "after a year and a day." The operation appears not to be nearly so complicated or severe as many cases of ovariotomy, and it is suited to all cases of cancer of the neck and body of the uterus, provided the "anterior part of the vaginal *cul-de-sac* (*das vordere Scheidengewölbe*) is completely healthy." Dr. Fränkel further believes that by its means we shall safely remove "malignant tumours of the fundus—sarcomata and cancers—and subserous and interstitial fibroids." He also believes that cases of irrepressible hemorrhage due to uterine fibroids which cannot be enucleated will be better cured by total extirpation of the womb than by Hegar's plan of castration.—*Med. Times and Gazette*, Oct. 19, 1878.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

A Test for Chloral Hydrate.

Dr. FRANCIS OGSTON, Jr., makes the following observations (*Edinburgh Med. Journal*, Oct. 1878) on the test for chloral by sulphide of ammonium.

The addition of stale sulphide of ammonium to a solution of chloral hydrate of moderate strength, say 10 gr. to the drachm (the strength of the British syrupus chloralis hydratus), causes, in a short time (*not immediately*), the colourless liquid to assume a slight orange-yellow colour, the liquid remaining clear; on letting it stand, the colour gradually deepens to a brown, and now a cloudiness comes over it, which in about half an hour, or perhaps longer, is deposited as an amorphous precipitate of a brown colour, and which appears to consist of sulphur.

While the change of colour is going on and the brownness appears in place of the orange, a gas is given off of a most offensive smell, apparently a mixture of chloroform and hydrogen sulphide, with something in addition, in such quantity as to fill a large room in a few minutes.

In order to find out the smallest quantity of chloral hydrate which would give a reaction with ammonium sulphide—

(*a*) I dissolved 1 gramme of it in 100 cc. of water, took 1 cc. of the solution and added 1 cc. of ammonium sulphide, when the solution became of a canary yellow colour, passing through orange-yellow to brown in the course of about six hours, letting fall a slight brown precipitate and giving off a characteristic smell.

(*b*) I then took 10 cc. of the above 1 p. c. solution, which I put into 100 cc. of water, and, on adding 1 cc. of ammonium sulphide to 1 cc. of this solution, I got in about half an hour a slight straw colour, which had deepened to a pale orange colour in twelve hours, giving off no smell.

(*c*) Lastly, I took 1 cc. of the solution *a*, which I added to 100 cc. of water. Of this solution I took 1 cc., and added 1 cc. of ammonium sulphide, and, after standing for eighteen hours, the liquid had changed to an exceedingly faint straw colour.

Thus 1 cc. of *a* solution (0.01 gramme of chloral hydrate) gave the brown colour, the precipitate, and the smell.

1 cc. of the *b* solution (0.001 gramme) gave an orange colour, but neither precipitate nor smell.

1 cc. of the *c* solution (0.0001 gramme) gave a very faint straw colour.

The first and second of these results are, I think, sufficient to establish the presence of chloral hydrate; the third I should hardly trust to, as the reaction was so faint, though I verified it by repetition of the experiment.

I may further state, that the similarity of the reaction of ammonium sulphide with chloral hydrate to that with antimony salts, suggests a caution in accepting the orange coloration alone as a certain test for either poison. Antimony, on the one hand, may be known by the orange precipitate thrown down by the addition of an acid, which does not follow when it is chloral hydrate which is present; and chloral hydrate, on the other, by the fact that the orange colour deepens on standing to a dull brown.

In conclusion, chloral hydrate alone seems to give this reaction with ammonium sulphide, for I have submitted many of the substances of similar chemical construction to the test without any such result following. Among these were chloroform, chloric ether, formic acid, etc.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

A Penetrating Wound of the Right Common Carotid Artery and Internal Jugular Vein, resulting in a "False Aneurism," with Rupture of the Tumour, and Complete Recovery of Patient. By E. PAUL SALE, M.D., of Aberdeen, Miss.

Miss Josie H., of Madisonville, Tenn., a blonde, æt. about 19 years, during the month of August, 1877, whilst rapidly descending a flight of stairs, by a misstep fell, together with a China bowl which she was carrying; the bowl was shivered, and she falling on it, was wounded by a triangular fragment, which penetrated the mesian line of the neck just over the cricoid cartilage, from which it glanced to the right, and passed obliquely downwards, inwards, and outwards into the "inferior carotid triangle," making a valvular wound : it tore up in its passage subcutaneous cellular tissue, and wounded either the right common carotid artery or internal jugular vein, possibly both, but as there seems to be some difference of opinion between her then attending surgeons as to the exact nature of the wound, I have thought it well to quote *in extenso* from letters received from two of them, Dr. W. N. Bicknell, of Madisonville, and Dr. R. F. Scruggs, of Sweetwater, Tenn. Before making the quotations, however, it is well to mention that the young lady was rescued from immediate death by hemorrhage, through the presence of mind of a sister who happened to be near and pinched up a fold of skin which included the wounded vessel or vessels, and held it until a surgeon arrived.

Dr. Bicknell, in a letter of Dec. 3, 1877, says : " I saw her fifteen hours after receiving the injury. [Dr. M. C. Duncan, of Madisonville, had preceded him; it is to be regretted I have not his opinion of the case.] I found her much prostrated, extremities cool, pulse frequent and feeble, so much so that at times it could scarcely be counted; occasional vomiting; at one time during the night she sank exceedingly low, but revived by the use of stimulants, and from that time on, although very feeble, she progressed favourably, until an attack of dysentery supervened, which prostrated her again to an alarming degree, after which she slowly recovered to the stage she was when she left home. As to the injury, and how she was hurt, etc., I presume you are fully informed. The flow of blood was in a *continuous stream*, as represented to me by Dr. Duncan and others, was easily controlled by pressure; and after it was stopped, an adhesive plaster was applied over wound, and there was no more bleeding for several hours, until she exerted herself a good deal when the bowels acted. The flow of blood, though considerable at the second hemorrhage, I understand was of the same character and appearance as the first. A compress was then applied below the wound on the right side of the neck, which controlled the hemorrhage, and it did not again recur. I am of the opinion that the bleeding in this case was from the jugular vein being torn ; the

blunt rough instrument inflicting the wound *may* have passed over the artery, bruising or otherwise injuring it, so that it may have given way, and now be a cause in the case with the wounded vein; but I do not think the carotid artery was tapped at that time: the bleeding *when arrested* was too easily controlled, the *steady* flow and appearance of blood, as represented at the time, was not arterial, as I believe. The compress that controlled the hemorrhage, it is true, was applied on the *cardiac* side of the external wound, but upon the *distal* side of the wounded vessel as I fully believed upon examination at the time I first saw her, and during the progress of the case the compress was back of and below the line of internal wound and over the site of the bloodvessel.

"The wound healed kindly and progressed well until she was debilitated by her dysenteric attack, which retarded it some, but did well at last. I did not notice *any tumour* or anything *abnormal about the wound* before she left."

Dr. Scruggs was with her during her second hemorrhage, which occurred about ten or twelve hours after the accident. In a letter to the brother of the young lady, he says: "I did not see your sister till after she had already had a very copious hemorrhage, and almost pulseless, reaction having only partially taken place, and as the hemorrhage was then checked, no interference was made nor troubling the wound in any way except to close the same and apply adhesive strips. When, after a time, a second hemorrhage took place, with a *florid* coloured blood, but no jetting that I discovered—the action of the heart had been so enfeebled in consequence of her former hemorrhage that the jetting may have been absent on that account. The artery being next to the windpipe, and the glancing having first been received on this, and borne off by the loose skin and soft parts, would most likely tap the nearest bloodvessels thereto, coupled with the fact that the blood was *florid*, and pressure between the puncture and the heart seemed to control it, I inferred that the right common carotid artery was tapped. The flow of blood being so rapid, and extreme prostration so instantaneous, I was led to the above conclusion. . . . There might be a possibility of the vessel being the jugular vein, but from my single visit and observation from all of the surrounding exciting circumstances I did not form this last conclusion. . . . The case was left in charge of Dr. Duncan, who was hourly expecting the counsel of Drs. Bicknell and Upton. The results of their deliberations have not been made known to me."

Miss H. came under my charge Nov. 6, 1877; she had then been in this city several weeks visiting her brother, and in giving a history of her case, told me that about the 15th of October past, after playing with a child, and tossing it up in her arms, she noticed the appearance of a pulsating tumour about the size of a filbert in the region of the "inferior carotid triangle" a little above and outwards from the *sterno-clavicular* articulation, which rapidly increased in size up to the time of her first consulting me. When I saw her first (Nov. 6, 1877) the tumour extended over the whole of the anterior and the inferior two-thirds of the right side of the neck, also encroaching somewhat on the left side; its inferior boundary was well defined by the *sterno-clavicular* notch, and the inner half of the clavicle making a globose tumour about as large as the half of a cocoa-nut of medium size, and very like it in shape, except that the acuminated end was truncated to an inch in diameter, corresponding to a point over the thyroidean isthmus. As regards consistence, it was comparatively hard at the base, but became elastic, very tense and fluctuating as the apex

was approached.   Pulsation was well marked throughout the tumour, and there was a slight aneurismal *bruit*.   The colour at the base was but an erythematous blush, which gradually deepened in hue from base to apex to red, then to a shining purplish shade.

In determining the character of the tumour it was patent from gross appearances that it was sanguineous in class, but as to its precise origin it was not so easy to decide.   Yet considering the past history of the case, coupled with careful and patient examinations, both by my associate in practice, Dr. J. M. Greene (who saw the case with me from time to time) and myself, we determined it to be a *false aneurism*, resulting from the wounding of the right common carotid artery and internal jugular vein. The diagnosis was based chiefly on the following points tersely mentioned : that pressure on the carotid artery near its origin (which was effected by means of a small curved metallic rod with a short transverse piece at its curved end) did not lessen the volume of the tumour, but it did the pulsation, and by conjoint pressure in the artery, and over the superior portion of the internal jugular vein, not only did pulsation cease, but the tumour materially diminished in size.

When I took charge of the case it was evident that the tumour was in imminent danger of bursting, and it was necessary to decide quickly on a plan of treatment.   The aneurism extending over the usual sites for ligating the common carotid artery and innominate arteries precluded any operative interference other than pressure, consequently this was attempted, but soon had to be abandoned on account of it having to be made acuminated at the *sterno-clavicular* articulation, which produced unbearable soreness of the tissues.   The only course then left was purely a tentative one, with the exception of the use of a broad, equal, and firm support to the tumour, as much quietude of body and mind as possible, and heart sedatives.   Under this treatment the aneurism ceased to increase, but it was evident that a thinning of the tissues at the apex of the tumour was in steady progress, which (about Nov. 18th) resulted in necrosis of the skin at the apex to about the size of a shilling, and rapidly increased to the size of a half dollar.   Then there was a gradual separation of the dry slough around the edges, and a slight oozing of blood occasionally, but its admixture with salicylic acid in substance (which was used as a dressing) formed rather a firm coating, and prevented its rupture for several days. Anticipating the culmination of the matter at any moment the relatives and nurses were instructed with precision how to act in the event, and I might mention parenthetically in this connection that there have been but few patients who received more assiduous nursing than she from her relatives and friends, more especially from her brother, who watched over her bedside almost day and night, prepared to control the hemorrhage.

On the morning of Nov. 21st, at three o'clock, I was sent for in haste (living only a few blocks distant) ; I reached her in time to stop quite a free oozing from around the edges of the slough.   The hemorrhage was kept in abeyance for only an hour, when, whilst standing near her lounge questioning my judgment as to the propriety of temporizing any longer, the question was quickly decided by a sudden welling up of blood, which afterwards broke forth in a stream the size of the slough.   The amount lost in a moment's time was enormous.   I hastened to her, and exerted pressure on the carotid artery and jugular vein, with the thumb and middle finger of my left hand extended, whilst with the right I " turned out the clot" from the tumour, and stuffed the then cavity with a small nap-

kin which happened to be lying near. These measures controlled the hemorrhage completely. I might remark *en passant* that the character of blood whilst flowing was noticed to be both arterial and venous, the demarcation of shades being quite apparent; and will also say that, on examining the clot which had been evacuated from the tumour, the base and edges seemed quite firm, and through its centre was a canal about a fourth of an inch in circumference, which had been tunnelled out by the stream from the carotid artery. Immediately after the stoppage of the hemorrhage, Dr. W. A. Evans, whose assistance I had requested, arrived just in time to see the patient pass into a violent convulsion on account of cerebral anemia, from which we thought at one time she would not rally, but by position and volatile stimulants she was relieved after a while. Soon after this Dr. J. M. Greene also came, and in consultation with the above-mentioned gentlemen, it was determined, as the tumour was gone, to search for the affected vessels and tie them. After waiting a while with patience to allow solidification of such clots as were supposed to have formed in the bloodvessels, we removed the napkin tampon, and afterwards very slowly the pressure, but were agreeably disappointed in noticing that there was not the slightest amount of hemorrhage, and were encouraged to again try pressure, which had before been so efficient in controlling it; consequently a compress was applied at and near the *sterno-clavicular* articulation.

Her treatment after this was absolute quietude in the recumbent posture for five weeks, sedatives to control the heart, concentrated nourishment and the smallest quantity of fluids—allowed to be taken—compatible with health. The valvular wound left was treated antiseptically with boracic acid, and healed by granulation in about four weeks. Compression over the site of the wounded vessels was continued for eight months by means of two elastic bands brought over the shoulder and breast and under the arms crossing each other over a compress made of a small sack stuffed with wool, the degree of tension being regulated by buckles on the bands.

When I last examined the neck in May, just before Miss H.'s departure for home, nothing abnormal could be detected, except perhaps a very positive degree of *bruit de diable* over and near the jugular veins; the lumen of both artery and vein seemed to have been re-established; and in a letter recently received from Dr. M. C. Duncan, of Madisonville, Tenn., dated Nov. 7, 1878, he says: "I examined Miss H.'s neck on the 30th of October last, and found it in an apparently healthy condition; her health is very good."

Reverting to that part of the history connected with the infliction of the wound, and the source of hemorrhage, though there is yet doubt about it, still I am inclined to hold the opinion that the bleeding *then* was from the jugular vein, the artery receiving a contused but non-penetrating wound from the offending body *en passant*. Although it is anatomically true that the carotid artery is between the jugular vein and trachea (the wound commenced over the last-named part), yet it is a well-known fact appreciated by military surgeons that arteries, on account of their cylindrical shape and resiliency, make almost miraculous escapes from wounds, whereas veins, being less elastic, and less tense, do not enjoy the same degree of immunity. The subsequent occurrence of the false aneurism was doubtless due to ulceration and consequent thinning of the arterial wall which

gave way coincidently with the recently formed and thin cicatrix of the vein under the increased blood-pressure whilst she was violently exercising in jumping a child.

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Injury to Eye, with Loss of Lens; subsequently, Remarkable Acuity of Vision. By H. S. Oppenheimer, M.D., Resident Surgeon at the New York Eye and Ear Infirmary.

M. C., male, æt. 32, a robust labourer, while chopping wood, was struck on the right eye by a flying stick. He presented himself at the Infirmary the next day, and was admitted as a patient on Dr. Callan's service.

The eye presented a slight cut at the tarsal edge of the upper lid, about its middle. The upper portion of the ocular conjunctiva was greatly ecchymosed. At the superior portion of the limbus, and following its curve almost exactly, was an irregular cut about five millimetres in length. In the lips of this wound could be seen some pigment, which was at the time thought to be a prolapsed portion of the iris.

The cornea was clear in most of its extent, and only around the wound showed fine, faintly-opaque lines. The anterior chamber was filled with blood, the iris and pupil invisible. V. = movements of hand. Tension — 2. No pain present. The treatment consisted of cold compresses, instillations of atropia, and the supine position in bed. No pain or inflammatory reaction ensued, the wound healed kindly, and at the end of two weeks after his admission the patient was discharged. At that time the anterior chamber was perfectly clear. At the level of the iris there was a web-like membrane stretched across the pupillary space, obscuring pupil and iris. Fundus still invisible. Tension about normal. One week after his discharge the patient returned. The membrane had disappeared completely, showing an entire absence of the iris, lens, and capsule.

A number of floating bodies could be seen in the vitreous. The fundus appeared normal in all its details, with the exception of a slight rupture of the choroid at its superior periphery. With $+ 3.4$ spherical V. $= \frac{20}{50} +$. Some astigmatism present.

Oct. 2. Patient presents himself to-day—seven weeks after the accident —the media perfectly clear (excepting a small stationary opacity in the posterior portion of the vitreous), and a $+ 3.2$ sph. with stenopaic apparatus, slit directed vertically, brings his vision up to $\frac{22}{20}$.

In this case the absence of all inflammation after such a severe injury to the globe, the small opening through which the iris, lens, and capsule must have escaped, the very rapid recovery after the extraction, which gave the patient vision of $\frac{20}{50} +$ at the end of three weeks (a result which would be very gratifying so short a time after an extraction *lege artis*), and the ultimate astonishing vision of $\frac{22}{20}$ (which is rarely attained after an operation under the most favourable circumstances) seem to me remarkable points of sufficient rarity and interest to justify publication.

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A Case of Paroxysmal Hæmatinuria, with Unusual Irregularity of the Paroxysms. By A. H. Goelet, M.D., of New York.

Attention was first called to this curious disorder by Dr. George Harley

in 1865 (*Med.-Chir. Trans.*, vol. xlviii.); and Roberts, in his excellent *Treatise on Urinary and Renal Diseases*, says:—

" Each paroxysm lasts from three to twelve hours, and it is noteworthy that no paroxysms occur at night; the urine voided before breakfast being invariably natural. . . . . The temperature during the paroxysm was observed in three cases; in one case it was 96.1°; in another it was 96.6° during the cold fit, and five minutes after the voiding of the porter-like urine it had risen to 98.6°; in a third case the temperature, after passing the dark urine, was 103.2°; this last case is the only instance in which a febrile heat existed."

The following case presents two unusual features, viz.: (1) the paroxysms did sometimes occur at night, and the first urine voided in the morning was not always natural; (2) the elevation of temperature was greater than has yet been noted.

CASE.—Mr. R., æt. 43, married, and of temperate habits, sent for me on the 9th of August, 1878, at which time he was suffering with pain in the region of the right kidney, and was passing dark porter-coloured urine. The history of the case was as follows: About the 19th of July he was taken with slight pain in the right loin, which increased in severity, and a day or so after he passed " bloody water" for the first time. He took some quack nostrum, which failed to benefit him, and then he concluded to take a trip to Richmond, Va., for his health. According to his statement his urine was " bloody" most of the time, but there were intervals when it was natural.

On his arrival in Richmond, about the 24th of July, he had an attack of retention, and called in a physician, who drew off his water, which was at the time " bloody," and contained a few small clots. The introduction of the catheter gave him considerable pain, though he had very little in the kidney, and no tenderness or pain in the bladder. His physician suspected stone, but sounded for it without success. The catheter was used twice a day for three days, after which time the retention disappeared. His urine remained " bloody" all this time, but became clear under the use of *watermelon-seed tea;* and remained clear until the 7th of August, when it again became " bloody."

He had an attack of malaria when about sixteen years old, but none since; and gonorrhœa about sixteen years since. Otherwise he has enjoyed good health.

When called to him, besides the symptoms already mentioned, he complained of chilly sensations, great depression and anxiety, and the bowels had not been relieved for several days. The temperature in the axilla was 104°, pulse full and strong. The urine was scanty, of a dark-red colour, highly acid, and contained a large quantity of albumen, which was thrown down in the form of a chocolate-coloured deposit with heat or nitric acid, the supernatant fluid being straw-colour. When agitated in a test-tube with a few drops of carbolic acid a pinkish coagula was produced which remained homogeneous. The urine, after being voided, if allowed to stand, separated into a brownish-red deposit, and a clear supernatant fluid which retained its deep-red colour.

Ordered a dose of Rochelle salt, a blister over the right kidney, and a mixture containing acetate of potash, sweet spirits of nitre, and tincture of hyoscyamus in camphor water, every two hours.

August 10, A. M. Considerably improved; pain entirely relieved. The urine was natural in colour, of normal reaction, and gave no coagula with

heat or nitric acid. Temperature 102°, pulse strong. Appetite good; could not retain the Rochelle salt. Ordered Seidlitz powder, and xv grs. quinia to be given at night, and v grs. in morning. The mixture every four hours.

11th, A. M. Very weak; urine changed again yesterday afternoon, and has remained "bloody" since. Temperature 104°. He did not retain the Seidlitz power, and was ordered pil. catharticæ co. iv, quinia xx grs. at night, and v grs. in the morning. The mixture to be discontinued.

12th, 7 A. M. Was sent for, and found patient nervous and frightened. The pills had operated. The first urine voided this morning, though "bloody," was not quite so dark as that of yesterday, but acid in reaction. Temperature 103°; ordered stimulus. P. M. The urine more deeply coloured, having the appearance of pure venous blood. Temperature 103°. Ordered x grs. gallic acid, to be repeated if necessary. Quinia as before.

13th, A. M. Urine passed at 11 o'clock is natural, but the first this morning was "bloody." Temperature 103°. Ordered fl. extr. of jaborandi in teaspoonful doses every two hours; gallic acid to be given when necessary. P. M. Was called in great haste; found profuse diaphoresis and retention. Urine was "bloody" again in afternoon, and he had taken x grs. of gallic acid. The introduction of the catheter was very painful, and its progress was arrested at the prostate gland, when the patient was seized with an irresistible straining, and on withdrawing the catheter a large clot was passed, followed by a quantity of "bloody urine" and smaller clots. Temperature 103°. Ordered x grs. gallic acid, to be repeated in the morning; the jaborandi discontinued.

14th, A. M. Though much improved, the urine has continued porter-coloured since last visit without any intermission, and contains small clots. Temperature 101¾°. Ordered x grs. gallic acid three times a day.

15th, A. M. Urine was natural at 11 P. M. yesterday, but the first voided this morning was again porter-coloured, with a few clots. Temperature 102°. Gallic acid continued.

16th. Temperature 100¾°. Gallic acid discontinued. Ordered xxx gtt. tr. of iron and v grs. quinia three times a day. The urine was natural yesterday afternoon, and until 6 o'clock this morning, when it was again porter-coloured. 10.30 A. M. Same, but without clots. 1 P. M. Same, with slight brownish deposit on standing, the supernatant fluid being red. 4 P. M. It is not so deeply coloured. 6 P. M. Amber-coloured with slight deposit on standing, which is only cloudy in appearance. 10 P. M. Urine voided more freely than before, but it is again porter-coloured.

17th, 3 A. M. Urine voided was natural. 9 A. M. Same, but with cloudy deposit; reaction normal. Bowels regular; appetite good. He is sitting up. Temperature 101°.

18th. Patient is improving. Urine is still natural, with only a slight opaque deposit. Temperature 99¼°. Ordered iron as before, quinia iii grs., and strychnia $\frac{1}{60}$ gr. three times a day. Temperature 98¾°.

20th. Urine was porter-coloured for the first three urinations this morning, but has since been normal. Temperature 99¾°. Iron, quinia, and strychnia as before.

24th. Patient called at my office and is doing well; no return of porter-coloured urine since last date. Complains only of a little soreness in the right lumbar region.

26th. Since the 20th he has had no return of the hæmatinuria, and is gaining strength. He continues the iron, quinia, and strychnia.

BELLEVUE HOSPITAL MEDICAL COLLEGE, CITY OF NEW YORK.

SESSIONS OF 1878–'79.

The Collegiate Year in this Institution embraces a Preliminary Autumnal Term, the regular Winter Session, and a Spring Session.

The Preliminary Autumnal Term for 1878–1879 will open on Wednesday, September 18, 1878, and continue until the opening of the Regular Session. During this term, instruction, consisting of didactic lectures on special subjects, and daily clinical lectures, will be given, as heretofore, by the entire Faculty. Students expecting to attend the Regular Session are strongly recommended to attend the Preliminary Term, but attendance during the latter is not required. *During the Preliminary Term clinical and didactic lectures will be given in precisely the same number and order as in the Regular Session.*

The Regular Session will begin on Wednesday, October 2, 1878, and end about the 1st of March, 1879.

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James R. Wood, M.D., LL.D., Emeritus Professor of Surgery.

Fordyce Barker, M.D., Professor of Clinical Midwifery and Diseases of Women.

Austin Flint, M.D., Professor of the Principles and Practice of Medicine and Clinical Medicine.

W. H. Van Buren, M.D., Professor of Principles and Practice of Surgery, Diseases of Genito-Urinary System, and Clinical Surgery.

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J. Lewis Smith, M.D., Clinical Professor of Diseases of Children.

Leroy Milton Yale, M.D., Lecturer Adjunct upon Orthopedic Surgery.

A distinctive feature of the method of instruction in this College, is the union of clinical and didactic teaching. All the lectures are given within the hospital grounds. During the Regular Winter Session, in addition to four didactic lectures on every week-day, except Saturday, two or three hours are daily allotted to clinical instruction.

The Spring Session consists chiefly of Recitations from Text-books. This term continues from the first of March to the first of June. During this Session, daily recitations in all the departments are held by a corps of examiners appointed by the Faculty. Regular Clinics are also given in the Hospital and in the College building.

Fees for the Regular Session.

Fees for Tickets to all the Lectures during the Preliminary and Regular Term, including Clinical Lectures	$140 00
Matriculation Fee	5 00
Demonstrator's Ticket (including material for dissection)	10 00
Graduation Fee	30 00

Fees for the Spring Session.

Matriculation (Ticket good for the following Winter)	$5 00
Recitations, Clinics, and Lectures	35 00
Dissection (Ticket good for the following Winter)	10 00

Students who have attended two full Winter courses of lectures may be examined at the end of their second course upon Materia Medica, Physiology, Anatomy, and Chemistry, and, if successful, they will be examined at the end of their third course upon Practice of Medicine, Surgery, and Obstetrics only.

For the Annual Circular and Catalogue, giving regulations for graduation and other information, address Prof. Austin Flint, Jr., Secretary Bellevue Hospital Medical College.

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Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of May.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding *fifty*) will be furnished to authors, *provided the request for them be made at the time the communication is sent* to the Editors.

The following works have been received:—

Zur Behandlung einfachen Fracturen der Extremitäten mit Gyps-Hauf-Schienen. Von Dr. F. BEELY. Königsberg, 1878.

Uber Sequesterbildung im Warzentheil des kinds. Von Dr. ARTHUR HARTMANN in Berlin. Wiesbaden: J. F. Bergmann, 1878.

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A Contribution to the Medicinal Treatment of Chronic Trigeminal Neuralgia. Report on Aconitia in Trigeminal Neuralgia. Clinical Lecture on Syphilitic Brain Lesions. The Diagnosis of Progressive Locomotor Ataxia. By E. C. SEGUIN, M.D. New York.

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Observations on the Treatment of Blepharospasm. By HENRY Y. CORNWELL, M.D. Youngstown, Ohio.

In Memoriam. Dr. LANDON R. LONGWORTH.

In Memoriam. ELI GEDDINGS.

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The Canada Medical Record. December, 1878; January, February, 1879.

The Canada Journal of Medical Science. January, February, March, 1879.

The Canada Lancet. January, February, March, 1879.
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The Journal of the Franklin Institute. Jan., Feb., March, 1879.
Boston Journal of Chemistry. Jan., Feb., March, 1879.
The usual foreign exchanges have been received ; their individual acknowledgment
is omitted for want of space.

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MEDICAL JURISPRUDENCE AND TOXICOLOGY.

RECLAMATION.

ARTICLE I.

ON INJURIES OF THE SCALP. By JOHN A. LIDELL, M.D., of New York.

WOUNDS of the cranial integuments should never be considered as trivial, or beneath the surgeon's notice and attentive care, since it not unfrequently happens that, even when they appear to be but slight, they are associated with dangerous lesions of the underlying parts, such, for example, as contusion of the cranium, linear or fissured fracture of the cranium, laceration of the middle meningeal artery, fracture of the internal table of the skull without corresponding fracture of the external table, contusion of the brain with ecchymosis of the pia mater, meningo-cerebral hemorrhage, encephalitis, cerebral abscess, etc. Seven fatal cases of "simple flesh wounds of the scalp" are returned as having occurred in the British army during the Crimean war. Concerning them the reporter remarks: "It is, however, believed that in all these cases some injury had been done to the contents of the skull, and, in all likelihood, most of them were cases of fracture or fissure of the cranium, which had not been detected." It is also stated that in one of them rupture of the longitudinal sinus and copious effusion of blood within the cranium were found after death. (*Med. and Surg. History of the British Army in Turkey and the Crimea*, vol. ii. p. 287.) Of the two hundred and eighty-two cases of incised wounds of the scalp recorded in the Medical and Surgical History of our own war of the rebellion, six terminated fatally. "Three died from some form of encephalitis directly resulting from the injuries received;" and "three died from complications." Besides these, "eleven were temporarily or permanently disabled," and, concerning them, Dr. Otis says: "Of those discharged for physical disability, or invalided, or pensioned, two suffered from mental aberration, others from vertigo, im-

perfect vision, headache, persistent pain at the seat of injury, ptosis, and amaurosis." (*Op. cit.*, Part First, vol. ii. p. 15.) Furthermore, many cases that have occurred in my own practice, or have otherwise come under my personal observation, some of which will hereafter be related, teach the same important lesson. Finally, it has passed into an aphorism among surgeons that "wounds of the scalp are attended and followed by more dangerous symptoms than wounds of the integuments on any other part of the body" (*Liston*).

But the integuments of the head exhibit certain peculiarities in respect to their anatomical structure and relations, which exert an important influence upon the symptoms, consequences, and treatment of the various traumatic lesions to which they are exposed. Now, these anatomical peculiarities, and the consequences thereof in a pathological point of view, should not be overlooked in this connection.

In the *first* place, the scalp is firm, dense, and laminated in structure. It consists essentially of a cutis that is very thick and very strongly adherent to the occipito-frontalis muscle or its tendinous expansion, but more especially to the latter, by means of a dense and somewhat ligamentous connective tissue, and these parts are so intimately blended thereby that it is not easy to separate them in dissection. The natural consequence is that collections of purulent matter (abscesses) are but seldom formed in the substance of the scalp itself; and when they occur beneath it, do not readily secure an outlet externally by the ulcerative process, therefore requiring, not unfrequently, to be evacuated by incision, and, if they are not opened in that way, give rise to troublesome and even alarming symptoms. Another important consequence of this remarkable density of the scalp is that when it happens to sustain a solution of its continuity it proves less tolerant of the employment of sutures in the dressing thereof than the tegumentary tissues on nearly every other part of the body.

In the *second* place, the scalp is but very loosely attached to the pericranium by means of connective tissue; and from this circumstance it results that when purulent matter is formed beneath the scalp, as happens not unfrequently in cases of erysipelas of the head, this matter is liable to become diffused over a large space in a short time, and, therefore, should be promptly evacuated by free incisions carried quite down to the pericranium. Oftentimes in cases of this disease, the patient cannot be saved by any other means.

In the *third* place, the scalp is highly vascular, wherefore it bleeds freely when wounded. Moreover, the contraction and retraction of the ends or mouths of its vessels when divided are, to considerable extent, prevented by the denseness of the tissues with which they are immediately surrounded, and therefore traumatic hemorrhage from the scalp is much less likely to cease spontaneously than traumatic hemorrhage from the integuments of any other part of the body; and, consequently, it is necessary

to employ surgical means in order to arrest tegumentary bleeding in this region much oftener than elsewhere. Besides, the scalp is less likely to slough, even when bruised and torn to great extent, than many other parts, because of the copiousness of its blood-supply, which results from the multitude of its vessels and the free inosculation of their terminal branches.

In the *fourth* place, the bloodvessels of the scalp communicate freely with those of the cranium and dura mater, and therefore an inflammatory disorder, for example, erysipelas, may readily spread from the surface of the head through the skull to the membranes of the brain.

In the *fifth* place, the scalp is very copiously supplied with nerves, both sensitive and motor, and from this circumstance it sometimes happens that injuries of this part, especially in young and irritable constitutions, give rise to obstinate neuralgias. Occasionally, also, wounds of the scalp are followed by tetanus of a fatal character, and a case of this sort will be related in some of the following pages.

The several traumatic lesions to which the scalp is exposed are : 1, *contused* wounds or *bruised* ; 2, *lacerated* wounds ; 3, *lacerated* and *contused* wounds ; 4, *gunshot* wounds ; 5, *incised* wounds ; 6, *punctured* wounds ; 7, *poisoned* wounds.

1. *Contusion of the scalp* is a form of injury that is often met with, especially in the persons of young children, for they are strongly prone by nature to bruise their heads by falling down and in other ways ; and, generally, it is not attended with disastrous consequences, unless the constitution of the subject happens to be diseased, or the external injury proves to be associated with some serious lesion of the more deeply-seated parts, such, for example, as contusion of the brain, fracture of the skull, etc. The last named circumstance, however, occurs with sufficient frequency, especially in adults, and in children that are partly grown up, to make it the duty of the surgeon to examine all cases in which the scalp is contused with thoroughness and attentive care ; and, in cases of children, even when no structural lesion of the cranium or the brain is revealed by such examination, he should inform the parents and attendants of the little patient, with regard to the possible consequences of the injury, such, for example, as consecutive inflammation of the membranes of the brain, cerebral abscess, secondary extravasation of blood within the cranium, etc., so that their attention may the more readily be excited by the premonitory symptoms of danger, so that the headache, restlessness, and fretfulness of cerebral irritation may not be mistaken by them for viciousness of temper, and thus the surgeon may receive from those charged with the care of the little patient timely notice of impending mischief, and be promptly brought to its relief. A thorough comprehension and appreciation of the premonitory symptoms of the consecutive disorders of the head which result from violence, may lead to the preser-

vation of some lives which would otherwise be lost, and unquestionably it would redound greatly to the credit of our art. With proper attention to this subject it would not happen so often as it has done heretofore that patients discharged from our hospitals and infirmaries nominally cured of scalp wounds, either suffer and even die at our homes, some time afterwards, from the consequences of the original injury which had not been forestalled and removed, or are compelled to return to the hospital for that treatment which they should have received in the first instance.

Rupture of some of the cutaneous or subcutaneous bloodvessels always occurs when the scalp is contused. Generally these lacerated vessels are small in size, the quantity of blood extravasated from them is also small, and infiltrated into the substance of the scalp or into the connective tissue underlying it at the place of injury; and, therefore, the amount of the tumefaction is usually not great. It is in this way alone that ecchymosis of the scalp is produced in a very large proportion of the cases of contused wounds of the head which come under the surgeon's notice. But, not unfrequently it also happens, especially when the contusing force is great and the bruise severe, that one or even more than one arterial twig of considerable size is crushed or ruptured by the blow, and blood in considerable quantity is extravasated therefrom into the substance of the scalp or into the loose connective tissue beneath it; and, in exceptional instances, beneath the pericranium also, *i. e.*, between that membrane and the skull. Thus, a tumour containing blood is formed at the place of injury; and it is produced either slowly or rapidly according to the size and number of the ruptured vessels. Now, this kind of tumefaction of the scalp may grow to a considerable size. It not unfrequently becomes as large as a hen's egg or even an orange. If the temporal muscle be the seat of the bruise and the extravasation of blood occur mainly beneath the temporal fascia, in the temporal fossa, the swelling is apt to be very hard or tense to touch, and considerably flattened in shape, because it is firmly covered over and bound down by that dense fascia. If blood escapes in large quantity in that situation, as, for example, when some large branch of the temporal artery is ruptured, the effusion may not be restrained within the limits of the temporal fossa, but, after filling up this fossa, it may burrow downwards along the fibres of the temporal muscle beneath the zygoma to the insertion of that muscle, and thence following the ramus of the lower jaw down to its base, it may accumulate there, and so cause great tumefaction in that locality far distant from the seat of injury. The following case is in point :—

CASE I.—A robust looking, but near-sighted man, aged 43, while walking home from business in a snow-storm, at a late hour on the night of Friday, March 22, 1867, was suddenly set upon and struck a violent blow on the left temple by an unknown person, with some blunt-faced instrument having four corners, supposed to have been a slung-shot. The night was dark and gusty, the air was full of whirling snow, and the walking

difficult from the presence of much sand-like snow on the pavement, often drifted into heaps, and there locomotion was harder still. Only one blow ·was struck, and his assailant instantly disappeared in the storm and darkness. In fact, he did not see his assailant at all. He heard a strange hissing sound in the air near his head for a moment, and then suddenly felt the impact of something on his left temple, like the kick of a horse. The blow staggered him and turned him partly round, but did not knock him down. With some difficulty he kept his feet, and on looking for his assailant he heard the sound of his retreating footsteps. The wounded man now felt bewildered and dizzy; but realizing that he was severely, perhaps dangerously, hurt, turned his footsteps immediately to the house of a friend who lived on the same block, instead of continuing his way home, which was more than a mile distant. As he made his way towards safety he noticed that his right leg was semi-paralyzed, *i. e.*, considerably weaker than the left one; still he did not fall down, and, aided by his cane, soon reached his friend's house without any other assistance. There ice was at once applied to the seat of injury, viz., the left temporal region, and this application was continued all night. The bruised part was already a good deal swollen. He was oppressed with a sense of immense tension or pressure beneath the left temporal fascia. He also felt as if the anterior part of the left cerebral hemisphere had been destroyed, and as if this portion of his head were empty. On examining his hat—a tall silk one, which was pulled far down over his eyes at the time of the assault— it was seen that the force of the blow had been largely expended upon the hat itself, and thus, in all probability, it came to pass that he was not killed on the spot. The hat-band was found crushed and disintegrated by the force of the blow through a space more than an inch long, to such degree that it parted spontaneously. The shape of the weapon was also found imprinted upon the brim and body of the hat. Careful examination of the place of injury failed to reveal any fracture of the skull, although an imprint of the weapon on the bruise, corresponding to that on the hat, was readily detected. It was nearly two inches square. Towards morning it was noticed that a soft swelling was forming in the left parotid region, and beneath the angle and base of the lower jaw on that side in parts which had not been hurt at all.

March 23. The left eyelids are considerably swelled and blackened from sanguinolent infiltration. The tumefaction beneath the angle and base of the lower jaw on the left side has attained a great size and interferes a good deal with the act of swallowing. It is estimated to contain over eight ounces of blood which has trickled down from the place of injury along the course of the temporal muscle, behind the zygoma, and so on down the ramus of the inferior maxilla. The feeling of vacuity as to the anterior part of the left cerebral hemisphere, mentioned above, was thought to be due to contusion of the cerebral convolutions lying beneath the place of injury. The other symptoms of cerebral concussion had disappeared, and the partial paralysis of the right leg had also passed away. Ordered quietude, a spare diet, the administration of a saline purgative, and the continuance of cold applications to the seat of injury.

On the 25th and 26th there was considerable headache, which was most marked in the neighbourhood of the bruise, together with some fever. Ordered magnesia sulph. ℥j on each of these days, with aconite in full doses, and the bad symptoms disappeared.

On the 27th the integuments covering the swelling in his throat, be-

neath the angle and base of the lower jaw on the left side, became discoloured by infiltration of blood from within, and this discoloration of the skin increased during the next day or two.

On the 30th it was observed that this sanguinolent swelling in the throat was decidedly softer and of diminished size.   Afterwards, as the process of absorption went on, it steadily grew less in bulk, and thus, in a short time, it disappeared.   The patient, however, was for a long time troubled with the sense of vacuity in the anterior lobe of the left cerebral hemisphere above mentioned, with traumatic neuralgia of the head and face, and the injured part of the left temporal muscle took on atrophy of a permanent character.

Comments.—This case serves well to show an important fact not generally known, and perhaps never before set down in print, namely, that a strong contusion of either temporal muscle may be attended with the formation of a large sanguinolent swelling in the throat beneath the angle and base of the lower jaw on the corresponding side.   On this point the history of this case leaves no room for doubt.   The neck itself sustained no injury during the assault.   The only part struck was the left temporal region.   There the swelling first appeared, and there it longest remained. There the imprint of the weapon was found, and to that locality the consecutive tenderness was confined.

This case also serves well to illustrate the plan of treatment which contusion of the scalp, when severe, usually requires.   The bruised part should be bared by cutting off the hair.   When the occurrence of internal hemorrhage is feared, the ice dressing should be applied.   When the contusion is only inflamed, *i. e.*, painful, hot, and tender, it should be kept wet with some discutient lotion, such, for example, as rectified spirit and water (part 1 to 3), or liquor plumbi subacetatis dilutus, or the lead and opium wash, or the well-known compound solution of muriate of ammonia. If the patient complains of headache it will be advisable to administer a saline cathartic, for example, one ounce of Epsom, Glauber, or Rochelle salts ; and if he is also feverish, give saline drinks, such as the neutral mixture of the pharmacopœia in half-ounce doses, for an adult, with one minim of Fleming's tincture of aconite root, every four hours.   Absolute quietude and a meagre diet should also be enjoined.   When consecutive inflammation of the brain or its membranes is threatened, the employment of these therapeutic agents, together with the application of the ice-bag to the head, is very necessary.   If the tumour suppurates, or if the blood contained in it putrefies, it should be promptly evacuated by a suitable incision.   The occurrence of suppuration may oftentimes be recognized by the tumour's acquiring a pointed appearance, and becoming soft or even fluctuating in feel at the place of pointing.   After the swelling has been emptied by incision, it is generally advisable to apply a warm poultice of ground flaxseed.   If the discharge be offensive in smell, a disinfectant, for example, liquor sodæ chlorinat., in suitable quantity (from ℥iv to

℥viij), should be mixed with each poultice, and the poultices themselves should be renewed at intervals of six or eight hours. If the discharge is putrid in character, the part should be dressed with a solution of carbolic acid in water (part 1 to 40), applied on lint and kept covered with oiled silk or gutta-percha cloth to prevent evaporation, instead of poultices. This antiseptic dressing should also be renewed at intervals of six or eight hours. We have just stated that when the sanguinolent swellings of the scalp, which are produced by contusion, suppurate, or their contents putrefy, they should be opened by the surgeon. It is our duty to state further, that under no other circumstances whatever should these bloody tumours be incised, since unhealthy, tedious, and troublesome suppuration is almost sure to follow (*Liston*). If phlegmonous erysipelas supervenes upon a bruise of the scalp, it should be treated in the same way as when it occurs spontaneously in the same part. At an early period suitable incisions should be made in the boggy, tumefied scalp for the purpose of relieving tension, evacuating putrescent sero-sanguineous matter and pus as soon as formed, and liberating sloughs of the connective tissue. At the same time a strongly supporting and tonic plan of constitutional treatment should be employed. Moreover, it should not be forgotten that erysipelas occurs more frequently in the head than in any other region of the body.

Again, the case just related serves well to illustrate some important consequences which may follow contusion of the scalp. As the bruised part regained its normal condition, the patient became a victim of *severe neuralgia*. The pains thereof were not confined to the place of injury, but presented a migratory character, and were experienced, at some time or other in the progress of the case, in nearly all of the parts supplied by the fifth pair of nerves on the left side of the head. But the paroxysms were observed to be more severe—to occur more frequently and to last longer—at the place of injury than elsewhere. Next to it the parts supplied by the inferior dental nerve of that side were the favourite seat of these pains. Like the neuroses in general they were much aggravated by fatigue or over-exertion. Whenever they became intense, the parts involved by them appeared to be warmer than natural. The application of cold water and ice to these parts, especially to the place of injury, was very grateful to the patient, and afforded more relief than anything else that was tried. This traumatic neuralgia, after continuing three months in full blast, then gradually wore away and ultimately disappeared. We may with propriety state in this connection that contusions of the scalp occurring in girls and young women sometimes occasion neuralgic pains in the injured part, and the vicinage thereof, of a severe character. Moreover, these pains are apt to prove extremely rebellious to treatment. Erichsen, however, mentions two cases which he had seen, wherein this affection, after lasting a considerable time, gradually disappeared; and

states that, in obstinate cases of this disorder, incisions down to the bone are said to have sometimes proved beneficial.

Finally, *atrophy of the bruised part* may be reckoned among the remote consequences of severe contusion of the scalp. Thus, in the case just related, the force of the blow was so great as not only to rupture some important branch of the temporal artery, but also to crush or disintegrate the substance of the temporal muscle itself through a space corresponding to the imprint of the weapon on the scalp. The bruise was attended with much tumefaction, as already stated. But as the swelling subsided the injured part of the temporal muscle wasted away and disappeared to such an extent that, five months after the injury, a hollow or sunken spot of considerable breadth and depth existed at the place of injury, which an inexperienced or inattentive surgeon might readily attribute to depression of the bone, instead of the true cause. Moreover, this atrophy of the injured part of the temporal muscle was never recovered from, and the deformity occasioned thereby was permanent. And now, more than eleven years after the assault, this part of the temporal muscle appears to be shrunken down to but little more than a thin plane of ligamentous or aponeurotic tissue.

There is another deceptive condition of the scalp, the result of fresh contusion, which the writer has several times met with, that should here be mentioned. It is not accompanied by much swelling, nor by the extravasation of much blood. In it the deep laminæ of the scalp are disintegrated and cut through, as it were, by violence of the contusing force, while the external laminæ remain entire. The place of injury is soft in the middle, but its edges are hard and sharply defined, and a superficial examination is liable to impart, to the sense of touch, the impression that the skull is fractured, and that a portion of it is depressed. If, however, the examination be carefully made, the surgeon will have but little difficulty in satisfying himself that the bone is not broken and that it occupies a normal position. Mr. Erichsen states that he has occasionally seen this condition of bruised scalp in children in whom that portion of integument is naturally soft and spongy. The writer, however, has met with it not only in children, but in adults also.

Before leaving this topic it is our duty to state that contusion of the scalp when it is produced by a gunshot projectile, but especially when it is produced by a cylindro-conoidal bullet, is, for the most part, an injury of very serious import. The correctness of this statement was abundantly shown by the experience of our army surgeons during the late war of the rebellion. On this point Dr. Otis remarks as follows : "Gunshot contusions of the head without breach of surface, of sufficient severity to cause ecchymosis, were invariably attended by commotion, concussion, or intracranial extravastion, and are classified and will be described in connection with injuries of the encephalon." (*Med. and Surg. Hist. of the War of the*

Rebellion, part 1st, vol. ii. p. 93.)   These views also fully accord with my own personal experience.   This subject will receive further elucidation in the latter part of this essay, while discussing the injuries of the cranial integuments which are produced by fire-arms.

2. *Lacerated and contused wounds of the scalp* very frequently come under the surgeon's notice.   They are produced by a great variety of the casualties to which man is exposed; for example, by falling down, by blows on the head inflicted with blunt and angular instruments, by the kicks of animals, by being thrown from carriages in motion, by being struck on the head by falling bodies, such as bricks, tiles, fragments of stone, tackle-blocks, and by being hit with the missiles of war.   This form of injury is often associated with certain obscure and dangerous lesions of the cranium, of the membranes of the brain, and of the brain itself, which have already been referred to on a previous page.   The surgeon should, therefore, when called to a case of contused and lacerated wound of the scalp, make a most thorough examination of the wound and of the patient, at the outset, for the purpose of determining, if possible, whether any of the parts beneath the scalp have been injured.   He should also be very cautious in stating the prognosis, unless he is perfectly certain that the deep-seated parts, such as the cranium, the intra-cranial blood-vessels, the meninges, and the brain-substance itself, are uninjured. and, to the end of keeping himself informed on this point, he should attentively watch the progress of the case.

This form of scalp-wound varies much in size and shape in different instances.   Sometimes it is so small as to attract but little notice, while in other cases it is so large that the cranial integuments are extensively detached from the bone, perhaps the ears also are torn off.   The following case presents us with a good example of an extensive scalp-wound of a contused and lacerated character :—

CASE II. *Caused by being thrown from a wagon ; Extensive Denudation of Skull ; Recovery ; Wound united by Adhesion.*—Mr. D., aged about 60, a farmer, always strong and healthy, was run away with by a pair of horses, and thrown from his wagon with great violence, on the afternoon of October 20th.   He fell head-foremost to the earth, and thus received a severe wound of the scalp.   He was picked up in an insensible condition, from concussion of the brain as the result proved, and carried on an unhinged door to his home, a distance of half a mile, where I saw him about six hours afterwards.   The symptoms of shock had then disappeared; his skin was warm; pulse 90, and strong; and he had traumatic delirium of a talkative, busy character.   At first I thought he had been indulging in strong drink to excess, and that the excitement produced by it had not yet subsided, but satisfied myself on inquiry that such was not the case. His face was flushed, eyes bright, and the pupils were contracted.   He was not paralyzed in any part.   I found his head tightly bound with a handkerchief, and learned that it had been so applied, with a thick compress underneath it, for the purpose of arresting the outflow of blood from the wound, which was said to have been profuse.   Without delay I re-

moved this dressing, and the hemorrhage immediately returned. It proceeded from two branches of the temporal artery, which had been severed. I secured these with ligatures, and thus stopped the bleeding permanently. Both the proximal and distal orifices had to be tied. The wound was situated on the right side of the head, over the anterior part of the parietal and upper portion of the frontal bone. The scalp was cut and torn completely through to the bone. The wound was irregularly crescentic in shape. The flap of scalp embraced by it, which, by the way, was about three inches in length by four inches in breadth at its base, was stripped off from the skull, everted, and hanging down, supported only by its attached margin or base. The wound contained much sand and dirt, and there were many particles of gravel stuck in the raw surface of the everted flap of scalp. Having arrested the bleeding I proceeded next to cleanse the wound. I washed it gently but thoroughly with warm water. Thus the dirt and clotted blood were gotten rid of. I then carefully picked out all the particles of gravel and sand that were sticking in the flesh. His head being bald, no trouble was occasioned by the presence of hair. The skull, which was bare in the wound and therefore could readily be examined, had not sustained any appreciable injury. The scalp had been extensively torn and bruised, as stated above, by the glancing of his head off from a stone against which it struck when he fell, as I subsequently ascertained on examining the spot where the injury was inflicted.

Having gently dried the wound with a soft linen napkin, and brought out the ligatures, I coaptated its edges as carefully and accurately as possible, for the purpose of avoiding scar in the cure, which was a matter of some importance, because the patient was bald. I secured the coaptation at these points with silver wire sutures, and with several long narrow strips of adhesive plaster applied on the intervals between them, but did not put on a compress nor a bandage. Ordered one ounce of magnesia sulph. to be administered every four hours, until his bowels should freely move, and one minim of Fleming's tincture of aconite root to be taken every second hour, until my next visit. He was also directed to have cloths wet with cold water kept constantly on his head, to have no food besides water gruel, and to be disturbed by light, and noise, and talking, and motion as little as possible. During the night his bowels acted freely, and towards morning he slept soundly.

On the following day, in the afternoon, when I saw him again, he was free from delirium, but had no recollection of anything that occurred since the accident; he still had some headache. Directed the aconite to be continued at intervals of four instead of two hours. The scalp-wound was doing remarkably well, there being but little redness or swelling.

He progressed towards recovery without an unfavourable symptom. The wound united by primary adhesion. There was no suppuration whatever, except at the site of the ligatures, and there only a few drops. At the end of the third day the silver wire sutures were withdrawn. They had produced no irritation whatever. At the same time the ligatures were extracted (pulled out), and afterwards the wounded part was dressed with adhesive plaster alone. I saw and examined this patient about six months after the accident. He was then in excellent health, not troubled with any head-symptoms, and the scar was even less apparent than I had expected it to be, which was very slight indeed.

Comments.—The history of this case also seems pretty well to illustrate the principal points in the treatment of contused and lacerated wounds of

the scalp. The indications to be fulfilled by the surgeon in the management of this form of injury are the following:—

First. The suppression of hemorrhage. In the case just related it was necessary to tie several wounded vessels in order to stanch the bleeding. Compression had been faithfully tried for several hours, but without success, a circumstance due in great measure to the exceeding vascularity of the scalp on the one hand, and to the fact that, from the denseness of its structure, the open mouths of the wounded vessels cannot contract and retract, and finally become plugged up with blood-clot, as readily as in almost any other part of the integuments. It was also found to be necessary, in this case, to tie both the proximal and distal orifices of the severed vessels, because of the free communication (anastomosis) which exists between the terminal branches of the arteries in the scalp, between those distributed on the opposite sides, *i. e.*, across the median line, as well as those belonging to the same side of the head. The several procedures which may be employed for the arrest of hemorrhage from scalp wounds are compression, torsion, ligation, acupressure, the use of styptics, and the actual cautery. If the blood escapes in jets and torsion fails to arrest it, a ligature should generally be applied without delay. Indeed, as the ligature is one of the most ancient, so it is one of the most convenient and reliable of all the means at our disposal for the suppression of hemorrhage. If the bleeding be parenchymatous in character, and not attended with sloughing, the application of styptics, such as liquor ferri persulph., together with compression, will generally suffice. But if parenchymatous hemorrhage occurs from a sloughing wound, the actual cautery will often be required. In cases of non-parenchymatous hemorrhage where the bleeding is profuse, the parts sloughy, soft, and much swollen, so that the application of ligatures in the wound would be extremely difficult, if not impossible, it is advisable to make trial of acupressure before proceeding to tie the main arterial trunk at a distance from the injured part.

Second. The wound should be thoroughly cleansed and carefully searched for the discovery of any foreign bodies, which should always be completely removed. In the case related above, the wound, as soon as the bleeding was stanched, was gently washed out with warm water, and then all the particles of sand and gravel still remaining therein were carefully picked out with forceps, one by one.

Third. The hair should be cut off and the scalp shaved to a distance of several inches from the wound, unless the patient is bald, in order to facilitate the application of dressings, promote cleanliness, and thus hasten the cure.

Fourth. The edges of the wound should be accurately coaptated and retained in that position by the employment of suitable dressings. In the foregoing case, having gently dried the wound with a soft napkin, we brought the edges together in such a way as to restore as nearly as possible

their original relations, but finding that strips of adhesive plaster, however numerously applied, would not suffice to maintain this coaptation, we employed the interrupted suture at three points, using silver wire instead of silken thread, because it seemed less likely to irritate the scalp, and because it would enable us to make a neater coaptation. Furthermore, the sutures and the ligatures were removed from the wound, as soon as the objects for which they were employed had been accomplished, and the flap was then supported externally by strips of adhesive plaster alone. Thus, the wound was always lightly dressed. Thus, also, the precepts of modern surgery were carefully followed out, and we were rewarded for our pains by obtaining a speedy and a gratifying cure for our patient. One of the greatest practical surgeons who ever lived has said : " If a large flap of integument is detached, it should be replaced, and retained as nearly as possible in its natural situation ; and if, for this purpose, strips of adhesive plaster and methodical compression prove insufficient, it will be necessary to employ a very few points of interrupted suture ; these, however, must be removed at an early period, that is, when either adhesion or suppuration has commenced, and ought, if possible, to be altogether dispensed with, being apt in this situation to produce injurious effects by their irritation." (*Liston.*) Concerning the employment of sutures in treating incised scalp wounds, Dr. Otis, the surgical historion of our war of the rebellion, remarks, in view of the experience on this point collected during the war, as follows : " There can be no doubt that exaggerated apprehensions have been entertained with respect to the employment of sutures in wounds of this class ; but, as the scalp has but slight elasticity, and retracts but little after division, stitches are rarely indispensable. Neudörfer makes the practical observation that when wounds of the scalp are approximated by adhesive strips, the lips are inverted, and the healing of the wound is long delayed by the growth of the hair. On this account he greatly prefers to unite such wounds by points of sutures. Hennen, and Guthrie, and Adams also sanction the employment of sutures in scalp wounds where there is much retraction of the edges. Whatever the mode of coaptation adopted, the importance of leaving sufficient intervals for the escape of discharges was generally recognized." (*Op. cit.*, part first, vol. ii. p 16.) Liston, however, has most clearly laid down the indications for the employment and the rules for the management of interrupted sutures in scalp wounds.

Another interesting feature of our case is that notwithstanding the great extent to which the scalp was torn and bruised, no part of it was lost by sloughing. This circumstance shows that the integuments of the head are endowed with a high degree of vitality, and that in all similar accidents, the detached scalp, even when torn more extensively and bruised more severely, ought never to be cut off by the surgeon at the outset, but

that it should be left for nature to determine how much if any part thereof must be destroyed.

Again, it is worthy of remark, that, although the cranium in this instance was extensively denuded of its periosteum by the accident, no part of it was subsequently cast off by exfoliation. This circumstance shows that the detachment of the pericranium does not of necessity destroy the vitality of the denuded bone, or any lamina thereof, and that the bones of the skull may, at least for a time, receive a sufficient supply of blood from other sources to maintain their vitality intact, irrespective of the pericranium. This important fact in surgical pathology did not escape the notice of our predecessors, and was by them turned to practical account more than one hundred years ago. Thus, Quesnay, after reciting a case treated by M. Malaval, wherein the pericranium was extensively stripped off from the frontal bone of a lad, aged twelve years, by the kick of a horse, notwithstanding which the wound was healed in a week without any unpleasant symptoms, and after relating two additional cases, that occurred in the practice of the same surgeon, wherein the pericranium was extensively separated from the skull by an extravasation of blood, the result of contusion, without any ill effects to the bone, says : " We will merely remark by the way, that these three observations of M. Malaval may serve to give confidence to some who may hesitate about reapplying to the bone the detached flaps of integument, especially when contused; for we see that this practice, which has for a long time received the approbation of the highest authorities, succeeded perfectly here, although the wounds were contused ones." (*Memoirs of the Royal Academy of Surgery of France*, selected, pp. 17, 18.) I have discussed this point in the history of our cases at some length, because the doctrine which ascribes to the periosteum an office or a commanding influence in the genesis and necrosis of bone that it does not possess, is by no means a harmless fancy. In practice it is liable to bear mischievous fruits, for in cases where this membrane is detached from the bone, the latter being uninjured, it may lead the inexperienced surgeon to harm his patient by adopting an erroneous plan of treatment, or to bring discredit upon himself by prognosticating results which will not follow.

Furthermore, our patient was affected with traumatic delirium of a sthenic type. He exhibited well-marked symptoms of cerebral irritation, resulting, no doubt, from the violent concussion to which the substance of his brain had been subjected, and showing themselves in the period of reaction that follows the symptoms of shock with which cerebral concussion, when severe, is always attended. For the relief of this disorder of his brain saline purgatives in full doses, together with aconite, were administered, with a most happy result. My own experience has fully convinced me that aconite is a most useful sedative in all acute disorders of the brain of a sthenic type, and on this point my views accord with those

of Solly. (Vide Solly *On the Brain*, pp. 356, 363, Am. ed.)   The history of the foregoing case, then, serves to illustrate the great value of saline purgatives and aconite, when combined with quietude and a low diet, in treating the sthenic forms of cerebral irritation.

Our patient also lost a considerable quantity of blood by hemorrhage from the wound, without any bad consequences ; indeed, it is probable that he was even benefited thereby.   This circumstance should teach us not to undervalue bloodletting, both general and local, as a remedial measure in similar cases.

But the hemorrhage from a lacerated and contused wound of the scalp of only small extent may be so great as to prove fatal.   Death from hemorrhage actually occurred in the following case wherein the left temporal artery was accidentally penetrated by a wound of this sort :—

Mr. Douglass, a barrister of the Middle Temple, aged 58, was on Christmas morning found dead in his chambers, Garden Court, Middle Temple, through the loss of blood from a wound in his head inflicted by falling against the small key of his book-case.   Mr. Hutchinson, of Chancery Lane, who examined the body, said that if he had had timely assistance the hemorrhage could have been stopped and his life saved.   Deceased, who was subject to epileptic attacks, fell, it is supposed, during one of these seizures, with his head against the key which opened the left temporal artery.   He was heard to fall at 7 A. M., and found dead at 9 the same morning. (Eve's *Surgical Cases*, p. 747 ; also *Lancet*, 1852.)

3. *Gunshot Wounds of the Scalp.*—The solutions of continuity belonging to this category are, in a large majority of instances, essentially contused and lacerated in their nature.   They are not unfrequently produced by spent balls impinging against the skull, and, in such cases, the features which belong to contused wounds of the same part are apt to predominate. If a small-arms projectile strikes while moving at a very low rate of speed, its force may not be sufficient to break the skin, and in such case the injury of the scalp consists entirely of contusion.   All surgeons much experienced in warfare have probably met with instances of this sort.   The writer has seen a considerable number of them.   If the velocity of the projectile is somewhat greater, the force of its blow may suffice to break the skin without penetrating it, and then the wound possesses a mixed character of contusion and laceration, with the first-named element predominating.   But when the projectile strikes the head obliquely while moving with considerable velocity, and at the same time does not injure the skull, it may tear a ragged groove or furrow in the integuments.   In such a wound the laceration of the injured part becomes a more prominent feature than the contusion.   When the velocity of the projectile is very great, the furrow in the scalp, produced by it, is usually much smoother, and bears considerable resemblance to an incised wound.   Generally, other things being equal, the greater the velocity of the projectile in cases of gunshot wound of the scalp, the stronger becomes the resemblance to solutions of continuity produced by cutting instruments.   It is obvious that in such wounds the contusion is a very subordinate element, and that

the laceration constitutes the principal feature. Pure contusions of the scalp on the one hand and pure lacerations on the other must, however, be considered as only the exceptional results of gunshot injury; for, in a large majority of instances, as already stated, these wounds have been found to partake of a contused and lacerated character.

The following case presents us with an example of such a wound of the integuments of the head, and will serve to illustrate the nature, progress, and termination of this form of injury :—

CASE III. *Gunshot Wound of Scalp; Cranium not injured; Recovery.*—Lieut. G. P. B., Co. G, 2d North Carolina Cavalry (Confederate), aged 23, was wounded in the head by a small-arms projectile and captured, June 20, 1863.

On the 24th he was brought to the Stanton Military General Hospital, at Washington, of which the writer was then the surgeon-in-charge. A furrow or groove which the bullet had ploughed along the scalp, was found on the left side of his head at the upper part thereof. This wound or furrow was about three inches long, with elevated, gaping sides or edges, and presented a somewhat ragged appearance. It was moderately inflamed and dry looking, the discharge being very scanty. On careful examination it was found that the projectile had torn through the scalp and uncovered the pericranium, at the middle part of the wound, but had not done any perceptible injury to the osseous tissue. The bone was not bare, nor indented, nor roughened, and the pericranium itself was not ecchymosed. His general condition was good. For treatment, directed the hair to be removed through a space of several inches about the wound, a water-dressing to be applied, his bowels to be kept loose with saline purgatives, his diet to be light and unstimulating, and specially enjoined upon him to abstain from exercise or unnecessary physical exertion, and to avoid all excitement.

June 29. Wound presents an ash-coloured, sloughy appearance; its edges are considerably swelled; discharge thin, dirty-looking, and offensive in smell. He also complains of headache, has had slight rigors, and is feverish. Prescribed liquor sodæ chlorinat. dilut. (1 part to 12 of water) to be applied on a compress as a dressing for the wound, the compress to be kept constantly wet with the lotion, and morphia sulph. gr. one-sixth to be taken at night as he complained of inability to sleep. Directed the progress of the case to be closely watched with a view to determine whether the constitutional symptoms were due to malarial intoxication, or to some obscure inflammatory disorder of the parts beneath the wound, although we were disposed to accept the first-named explanation.

July 1. The wound presents an improved appearance; it discharges freely a puriform matter, the slough is melting away, and granulations are beginning to appear. Patient's general condition also decidedly better, although he has slight diarrhœa. Ordered the wound to be poulticed with ground flaxseed, with a view to promote the separation of the dead tissue.

8th. He took a chill believed to be of malarial origin. Prescribed quinia sulph. grs. v, to be given three times a day, and a water dressing to be applied to the wound instead of the poultice. The wound itself was now clean and granulating satisfactorily, the discharge moderate in quantity, and consisting of thick, purulent matter.

20th. Patient improving rapidly, and the wound nearly closed. Dis-

continued medicine and allowed full diet. The granulations being exuberant, directed them to be touched with nitrate of silver daily until that condition disappeared.

August 1. The wound being healed and the patient in good health, he was transferred to the Lincoln Military General Hospital, for exchange as a prisoner of war.

Comments.—Gunshot wounds of the scalp are less likely to heal by first intention than almost any other lesions of the cranial integuments having a contused and lacerated nature. They generally suppurate and heal by granulation. Their cure is therefore comparatively slow and protracted. This peculiarity of gunshot wounds in general was noticed in former times, and was then ascribed to some mysterious agency. It was believed that the wounds inflicted by so " devilish an engine" as a gun were in reality poisoned wounds, that the missiles producing them acquired an envenomed nature and a cautery-like action from the explosive force, or from some mysterious property of gunpowder. At the present day, however, the surgeon is not disturbed by such dreadful fancies. He says in the language of John Bell, " there is a peculiarity, but no mystery in gunshot wounds." He recognizes the circumstances upon which the peculiar features of gunshot wounds depend. Some of these circumstances are illustrated by the case just related. The violence of the contusing force with which the projectile moved was so great as to completely destroy the vitality of the tissues that immediately surrounded the track made by the projectile in the substance of the scalp. In this way a thin lamina of the wounded tissues was killed outright. Afterwards the thin layer of dead tissue was detached from the living by an ulcerative process, and cast off like a slough. Hence the ash-coloured appearance which the wound at one time presented. Generally, the bruised tissues, in cases of gunshot wounds of the scalp, slough off to a moderate extent, and leave a healthy granulating surface. The substance lost in this way usually consists only of a thin lamina surrounding the track of the projectile, and, owing to the superior vitality of the scalp, is generally much less extensive than that which attends gunshot wounds of the integuments on most other parts of the body, of similar severity. The place of the tissues thus lost is, to a certain extent, supplied anew by the granulating process, the wound gradually contracts, and, after a time cicatrizes, when the cure becomes complete. Thus, we have shown to us the reason why, as a general rule, gunshot wounds of the scalp do not unite by primary adhesion, and likewise the reason why their cure is apt to be protracted. To this rule, however, exceptions sometimes occur, for wounds of the cranial integuments inflicted by rifle balls, and other gunshot projectiles, do occasionally heal by the first intention ; and, in general, the more closely such a wound resembles a purely lacerated or a simple incised wound, especially the latter, the more likely is it to unite by primary adhesion. Examples in point are not unfrequently afforded by the traumatic lesions of the integuments at large

which are inflicted by more or less sharp fragments of exploding shells. The more largely contusion prevails as an element of the wound the more certain is it to suppurate and heal by granulation. Still, I have no doubt that, in exceptional instances, wounds of the scalp occasioned by leaden bullets heal by the first intention.

But, gunshot wounds of the scalp, restricting the use of the term to those that are properly so called, are attended with a very considerable mortality. This fact is well shown by the statistics and the histories of many cases of this form of injury that were collected during our war of the rebellion. On this point Dr. Otis, the accomplished author and compiler of the surgical history of the war, remarks : " The 7739 cases are accounted for as follows : 162 patients died, 1186 were discharged, and 6391 recovered. But as 1186 patients discharged include many who were mustered out on the expiration of their term of service, or who failed to return from furlough, or who deserted, a nearer approximation to exact truth is attained by the statement that 162 died, 522 were discharged on certificates of physical disability, and 7055 probably recovered. The death-rate of gunshot wounds of the integuments of the cranium during the late war was, therefore, about 2.09, or nearly one fatal case in 48." (*Op. cit.*, part first, vol. ii. p. 89.)

Dr. Otis also gives brief abstracts of the 162 fatal cases, as well as of 38 that recovered. With regard to the fatal ones, he says : 54 are reported as uncomplicated. In every instance, the most careful scrutiny has been exercised to determine if any injury of the cranium, or its contents, was suspected by the surgical attendants." (p. 71.) Nine others died while on furlough, " and it has been impossible to ascertain particulars of the complications which led to the fatal results." (p. 74.) Thus we find that " the records are silent regarding the causes of death in sixty-three examples of gunshot wounds of the scalp here enumerated. The average interval between the reception of the injury and the fatal termination was twenty-seven days. It may be suspected that in most, if not all, of these cases, there was some undiscovered primary or secondary lesion of the skull or its contents, but precise evidence on the subject is wanting. The seat of the injury is specified in twenty-seven cases ; as in the frontal region in seven, the temporal in two, the parietal in twelve, the occipital in six." (p. 75.) With regard to twenty-two cases which terminated fatally from inflammation of the brain or its membranes, he remarks : " The reports indicate that the injuries were carefully examined, and that the observers were convinced that there were no primary lesions of the skull." (p. 75.) Concerning eight other cases, he says : " It may be in- ferred from the nature of the prescriptions, that some form of encephalitis supervened and induced the fatal results ; but the precise nature of the secondary complications were not reported." (p. 77.) Eight cases were also reported " which terminated fatally in consequence of the meningeal

inflammation following the invasion of erysipelas." (p. 79.) Four died
from traumatic gangrene. (p. 80.)   Two cases, " complicated with hemor-
rhage, had a fatal termination." (p. 82.)   In five cases tetanus was the
cause of death.   " In every instance the invasion of this complication was
ascribed to exposure to dampness, with sudden depression of the tempera-
ture of the atmosphere." (p. 83.)   Five died from pyæmia. (p. 84.)   In
twelve cases " the fatal results are ascribed to typhoid fever." (p. 85.)   In
four cases " the fatal terminations were attributed to incidental malarial
attacks.   But as the symptoms were not minutely described, and the
necroscopic appearances were not observed, suspicion arises that, in some
of the cases at least, the chills may have been symptomatic of internal sup-
puration, or a part of the characteristic phenomena of pyæmia." (p. 86.)
" In thirteen cases of gunshot wounds of the scalp, pneumonia is reported
as the cause of death ; but, in several of them, it is questionable if the pul-
monary complications were not embolic phenomena, indicating the forma-
tion of metastatic foci, and whether these cases would not have been more
properly classified under the head of pyæmia." (p. 86.)   Three fatal cases
were complicated by the supervention of variola. (p. 87.)   In one case
hepatitis, in four cases diarrhœa, in one case privation in prison, in one
case diphtheritis, and in one case delirium tremens were reported to be the
causes of death. (pp. 87, 88.)

Upon the foregoing summary statements Dr. Otis makes the following
interesting and instructive comments :—

" In discussing the ratio of fatality of gunshot wounds of the scalp, deaths from
intercurrent diseases have been included in the estimates, in conformity with the
system of reports in the United States army.   In one hundred and twenty-two
of the one hundred and sixty-two fatal cases, death would appear, beyond ques-
tion, to have resulted, either directly or indirectly, from the effects of the wound ;
some form of encephalitis being the proximate cause in ninety-eight cases, and
such complications as erysipelas, gangrene, hemorrhage, tetanus, and pyæmia, in
twenty-four cases.   The remaining forty cases include twenty-nine deaths, attri-
buted to typhoid and malarial fevers, and pneumonia, in regard to which it is dif-
ficult to determine how far the febrile or pulmonary symptoms were sympathetic
only, and eleven deaths, due to variola, diphtheritis, hepatitis, privation, and de-
lirium tremens, the original injury having little if any connection with the fatal
event.   The duration of life after the reception of the injury, of the one hundred
and sixty-two fatal cases, taking an average from them all, was forty days.   The
mean interval in the cases in which the fatal terminations were due to encepha-
litis, was twenty-four days.   Some of the patients who succumbed to secondary
diseases less directly dependent on the injuries received, survived many months."
(Medical and Surgical History of the War of the Rebellion, part first, vol. ii.
p. 94.)

Gunshot wounds of the scalp, using the term in a properly restricted
sense, are attended and followed by more disastrous consequences than
most other solutions of continuity of the cranial integuments of similar ex-
tent and not complicated with appreciable lesions of the underlying parts.
For this exceptionally bad character which gunshot wounds of the scalp
possess there is a threefold reason : 1. Gunshot wounds of the cranial
integuments are, in general, attended with a much higher grade of inflam-

matory reaction than incised or lacerated or contused wounds of the same part. 2. The inflammatory process is not only more severe, but it is also much more liable to spread from gunshot wounds of the scalp to the underlying parts, such as the diploë, the membranes of the brain, and the brain itself, than it is to spread from other wounds of the same parts. 3. Gunshot wounds of the scalp are much more apt to be attended with injury of the histological elements or morphological constituents of the underlying parts without breaches in the structure which are cognizable by our unaided senses, than the other forms of injury to which the cranial integuments are exposed. This circumstance affords the reason why gunshot contusions of the scalp, while seemingly quite trivial, are really injuries of very serious import.

We are not surprised to find that scalp wounds inflicted by gunshot projectiles are more frequently accompanied by unrecognized injury of the parts beneath, than like wounds of the same tissues produced in other ways, when we attentively consider the peculiarities of the method by which the mechanical force that does the injury is usually applied in such cases, in other words, when we attentively consider the elements of the destructive power of bullets. Our present purpose requires us to mention but two or three of these peculiarities. They are, firstly, the very great velocity with which gunshot projectiles are usually moving at the time of inflicting the injury, when compared with that which pertains to the motion of other bodies causing analogous injuries. A bullet, whose force is mostly spent, is still moving very much faster than a horse's foot in kicking, or a brick in falling from a scaffold, or a tile in falling from the roof of a house. A bullet, whose force is mostly spent, is still moving very much faster than a human head ever does in falling to the earth. The difference in comparative velocity is, of course, very much greater, we might, with propriety, say almost inconceivably greater, when the bullet is in full flight; and most of the simple injuries of the scalp of a contused, or lacerated and contused character, that are not produced by gunshot projectiles, are produced either by falling bodies or by blows from the human hand or some weapon held in it, or by the kicks of animals, or by the falling of the head itself against the earth or some other firm body.

The second of these peculiarities is the comparatively small objective surface which a bullet presents when contrasted with the corresponding surface of most of the other bodies mentioned above. Now, the remarkably destructive power of bullets results mainly from the rapidity of their motion, the smallness of their objective surface, and the largeness of their weight. It is upon these three elements that the peculiarities of gunshot wounds, as a class, mainly depend. Thus, experience has shown that the destructive power of gunshot projectiles increases in a notable manner as their velocity increases, when their objective surface and weight remain the same; also, that this destructive power is increased by augmenting the

weight of the projectile while its velocity and objective surface remain the same; and, again, that the destructive power is increased if the objective surface is diminished in extent while the velocity and weight are the same.

Practically, in studying the injuries of the head which are caused by a given projectile, such as a cylindro-conoidal ball of given dimensions, for example, a Springfield musket-ball, the velocity of its motion and the angle of impingement together with the structure of the part of the head that is struck, are the subjects of most interest to the surgeon, since the weight and the objective surface always remain the same. If such a projectile strikes the head fairly when in full flight, it carries everything before it, going completely through the head, and makes a perforation having a diameter about equal to that of its objective surface. If it strikes the skull at a very acute angle when in full flight, it may be reflected therefrom, or glance off as it is commonly termed, and produce a scalp wound without breaking the bone. In such cases, however, the pericranium is usually either torn or badly bruised, and the bone itself either bruised or indented somewhat, or grazed by the bullet. If such a projectile strikes the head fairly while moving at a considerably diminished rate its force is, not unfrequently, insufficient to penetrate beyond the integuments. It goes also through the scalp, hits the skull, becomes more or less flattened thereon, and there it either stops or lodges, or it bounds back from the skull, and escapes through the perforation in the scalp by which it entered. On examination, such an injury often appears to be only a simple flesh wound. But in such a case the destructive effects of the bullet are not, in reality, limited to the scalp. Its progress has been stopped by the skull and the underlying parts. Its force has not been sufficient to overcome the resistance which they offer, and to make a way for itself through them. It has struck a barrier through which it is not strong enough to pass. But it expends its force, whatever the amount may be, against the portion of the barrier that is struck, and principally on an area corresponding in diameter to that of its own objective surface. The projectile imparts its own motion, when its further progress is arrested, to the particles of matter lying beyond it, in the direction of its line of flight. Thus, a limited portion of the underlying structures, which are all more or less elastic, for example, the skull, the membranes of the brain, and the substance of the brain itself, are liable to be thrown into violent vibrations.

That such a result can be produced in this way is proved by every musket ball that rebounds from a cranium, for this new motion of the projectile is, for the most part, produced not by the elasticity of the lead of which the ball is composed, but by the resiliency of the cranium and the structures beneath it. Now, the several planes of tissues which enter into the composition of the skull, the membranes of the brain, and the brain itself, differ much in respect to density, toughness, elasticity, and strength. For example, the external table of the skull is tougher and more elastic than

the internal table. The diploë is sponge-like in structure, and its cells are filled with soft medullary tissue. The dura mater is thick, fibrous, and strong; the arachnoid thin, diaphanous, and weak. The pia mater consists of loose connective tissue, having many thin-walled bloodvessels ramifying in it. The substance of the brain is comparatively soft and delicate in structure. So when these several planes are thrown into vibrations by the stroke of a gunshot projectile whose further progress has been arrested by them, their vibrations are not rhythmical, but jarring and discordant, and the stronger the vibrations are the greater the discordance or clashing becomes. Thus, if the vibrations produced by the impact of the projectile are very strong or violent, the spongy structure of the diploë may be broken thereby, or the internal table of the skull may be fractured, or the membranes of the brain may be lacerated, or the substance of the brain itself may be bruised and even torn, or the longitudinal sinus may be ruptured, as happened in a case related in the surgical history of the British army in the Crimean war (*op. cit.* vol. ii. p. 287), or some bloodvessels of the pia mater may be ruptured and blood extravasated beneath the visceral arachnoid membrane into the sulci of the brain, as happened in the person of Col. Farnham during our own war of the rebellion (*op. cit.* p. 110), and in many other cases that I have seen, some of which will hereafter be related, and all this internal mischief, together with a great deal more of similar sort, may be produced without corresponding fracture or even apparent injury of the external table of the skull.

The gunshot wounds of the scalp observed during our war of the rebellion presented many varieties. There were mere scratches of the skin produced by shell fragments, solutions of continuity resembling incised wounds, bruises analogous to ordinary contusions with abrasions of the cuticle, furrows or more or less cleanly cut grooves made by bullets moving with great velocity, lacerations with flaps or with much loss of tissue, long fistulous tracks or tunnel-like canals, and wounds with lodgment of the missile (*Otis*).

Treatment of Gunshot Wounds of the Scalp.—The hemorrhage from such wounds is generally but moderate, and in a short time ceases spontaneously. If it does not the application of a compress wet with cold water, and a moderate amount of pressure by means of a suitable bandage may be advisable. If, however, the bleeding is profuse, and if a vessel of some size is wounded it is generally best to secure it without delay by ligatures applied one on each side of the bleeding aperture in its walls. The hair should be removed from the scalp in the vicinity of the wound to a considerable distance on every side of it. Foreign bodies should be carefully searched for and extracted. The foreign substances most frequently found in gunshot wounds of the scalp are the projectile itself or portions of it, hairs, fragments of the wounded man's hat or foraging cap, buttons, bits of metal torn from the soldier's uniform or equipments, and patches or wads

if smooth-bore rifles or bird-guns are the weapons. Sometimes particles of powder are found sticking in the wound, and, in rare instances, a tooth, a fragment of bone, or bit of clothing from a wounded comrade previously struck by the same bullet, which had been carried forward in its flight.

All foreign bodies having been removed, the bleeding stanched, and the wound thoroughly cleansed with warm water, the dressings should generally be light, and such as favour the separation of the eschar, and soothe the wound, e. g., the water, or some other emollient application. Inasmuch as we do not expect to obtain union by primary adhesion, it is in general not necessary to coapt the edges of these wounds nor to secure them in any way by sutures, or plasters, or bandages. In exceptional cases, however, for example, when a portion of the scalp is stripped off by a fragment of shell and still hangs by its edge, it is advisable to restore it as nearly as possible to its natural position, and retain it there by suture, and plaster, and bandage. Cuts of the scalp made by sharp splinters of exploding shells may sometimes be advantageously treated on the same plan. But in a large majority of the cases of gunshot wounds of the scalp the objects of the local dressings should be to soothe the inflammatory excitement, to promote the separation of the eschar, and, after it has been cast off, to favour the granulating process. All accumulation of pus in the wound should be prevented, and to that end counter-openings should be made whenever necessary. Seton wounds and fistulous canals should be cleaned at least once a day by syringing. If the inflammation is but slight, which fortunately obtains in most instances, some antiseptic and moderately stimulating lotion applied to the wound on a compress that is frequently changed, such, for example, as rectified spirit and water (part 1 to 4), or liquor sodæ chlorinat. (part 1 to 20), or a weak solution of carbolic acid (part 1 to 100), are generally found useful. If, however, the slough be extensive and the odour very rank, a stronger solution of carbolic acid (part 1 to 10), or of liquor sodæ chlorinat. (part 1 to 4), may be advantageously applied. After the process of cicatrization has commenced, and the wound has begun to contract, if the granulations are large, pale, and flabby, or weak, it is generally advisable to apply some dry dressing such as lint alone, or lint smeared with Peruvian balsam, or with resin cerate, and administer tonics internally, especially certain preparations of iron. The sesquichloride of iron in the form of pill or tincture is one of the best chalybeates on account of the ease with which it is assimilated. When it is advisable to administer a bitter tonic along with a chalybeate the citrate of iron and quinia is a convenient form for exhibition. If the granulations become exuberant they should be cut down with lunar caustic, or snipped off with scissors.

But, when the wound happens to be considerably inflamed, it becomes a matter of great moment to allay the inflammatory process in the scalp on the one hand, and to prevent its spread to the underlying parts on the

other.   For the statistics of our war of the rebellion, quoted above, clearly show that, in a very large proportion of the cases where death occurred, the fatal termination was due to extension of the inflammatory process from the wound to the underlying parts, such as the cranium, the diploë, the meninges, and the substance of the brain.   Generally, while we keep the inflammatory process at the wound and its vicinity within bounds, the patient having gunshot wound of the scalp, properly so called, may be considered to be in a safe condition.   Now, the most efficient of all the means we possess for the abatement of inflammation in scalp wounds, and for the prevention of its spread to the neighbouring parts is the application of the ice-bag, or, in its absence, of iced compresses or iced poultices to the inflamed wound itself.   I have employed cold in this way in a great many cases where the cranial integuments were wounded and inflamed, and always with most satisfactory results.   Indeed, my success with this practice during the war of the rebellion has attracted the favourable mention of a most competent judge.   Dr. Otis says : " In a number of cases where cerebral symptoms impended, besides resorting to general treatment, ice-bladders were applied to the head.   This method was adopted with advantage in numerous cases at the Stanton Hospital, at Washington, under the direction of Surgeon John A. Lidell, U. S. V." (*Op. cit.*, p. 95.)   I do not mention this in a boastful spirit, but for the purpose of impressing upon the reader's memory the great value of this practice.   An inflamed scalp-wound should, therefore, have cold applied to it in this way, not by fits and starts, but continuously during both night and day, until the object for which it was prescribed has been attained.   Rest in bed with a spare diet should also be enjoined, and saline laxative with cooling drinks should be administered.   If febrile movement of a decided character, together with headache and other symptoms of cerebral irritation are present, absolute quietude with a low diet should be insisted on, and saline purgatives should be given every six or eight hours together with aconite in full doses but at shorter intervals, according to the urgency of the case.

Again, there is considerable risk that gunshot wounds of the scalp may become complicated with pyæmia, embolic phenomena in the lungs, etc. The means which should be employed to avoid such a result are, *first*, the maintaining of a cleanly condition of the wound, and the use of the antiseptic dressings thereof already mentioned; and, *secondly*, the preventing of the spread of inflammation from the wound to the medullary tissue of the diploë, or the occurrence of cranial osteo-myelitis, by using the means just indicated.   In such cases, when pyæmia or embolism supervene, they have, for the most part, their starting-point in softening thrombi within the veins of the diploë, and coagula or thrombi do not form in these veins unless the medullary tissue that surrounds them is inflamed.   If, then, we can ward off the cranial osteo-myelitis, we can also ward off the cranial thrombosis together with pyæmia and the other accidents that may

spring therefrom. When, however, the initial symptoms present them-
selves they should be combated with quinia administered in doses of ten
grains three or four times a day, together with a free use of nutrients and
alcoholic stimulants. In all cases of scalp wounds where there appears to
be any liability to the occurrence of consecutive inflammation of the diploë
(osteo-myelitis), or of the membranes of the brain (meningitis), or of the
substance of the brain (cerebritis), a close watch should be kept for the
appearance of the earliest symptoms which announce that either of these
pathological conditions is impending, and, to that end, the surveillance of
the patient should not cease until a period of at least three or four weeks
have elapsed after the injury.

Secondary hemorrhage from gunshot wounds of the scalp not unfre-
quently appears, and whenever it does occur, it generally proves a very
troublesome complication. If the bleeding is but slight it may be con-
trolled by pressure and styptics. If, however, the hemorrhage is consider-
able, an effort should always be made to tie the bleeding vessel in the
wound, and this proceeding will generally prove successful if carried out
with reasonable care and skill. But, if the attempt at deligation fails, acu-
pressure should be tried before resorting to ligation of the main arterial
trunk.

Erysipelas often presents itself as a complication of gunshot wounds of
the cranial integuments. Generally, the form in which it appears in such
cases is a mild one, and then it gives but little trouble. In exceptional
instances, however, it proves to be very severe, and requires that all the
resources of surgical art should be brought to bear in order to successfully
combat it. In these cases of phlegmonous erysipelas, most prominent
among the local measures which should be employed are free incisions in
the tumefied and boggy scalp for the purpose of liberating sloughs and
facilitating the discharge of sanious or purulent matter. Among the con-
stitutional measures the administration of the tincture of the chloride of
iron and the muriate of quinia in full doses, together with alcoholic stimu-
lants in liberal quantity, are matters of the most importance. There is
scarcely another disease in which alcoholic stimulants, according to my
experience, do so much good as in phlegmonous erysipelas of the head.

Gangrene of a spreading character occasionally attacks the contused and
lacerated wounds of the scalp which are produced by gunshot projectiles.
This complication should be treated locally by the application of nitric
acid, and constitutionally by the administration of the tincture of the chlo-
ride of iron in doses of twenty drops with two grains of the muriate of
quinia every four hours, of nutrients and alcoholics, together with enough
of opium or morphia to assuage the pain, which is usually a troublesome
symptom in the cases belonging to this category.

4. *Incised Wounds of the Scalp.*—Wounds of the cranial integuments
produced by cutting instruments are generally much simpler in their nature

than the breaches in the same structures which are produced by other means.
They consist essentially of a comparatively clean division of the flesh, and,
therefore, present a comparatively clean appearance.   They are generally
not complicated with disintegration of tissue from contusion, nor with
raggedness of their edges from laceration, nor with ecchymosis from inter-
stitial hemorrhage.   Their lips have not been killed by the force of the
blow which made the wound, as happens not unfrequently in cases of gun-
shot and other severely contused wounds.   They contain no dead tissues to
be slowly separated and cast off from the living tissues by the process of
ulceration and suppuration, and then replaced by the process of granula-
tion.   With proper treatment they are not likely to suppurate at all, but
unite speedily by primary adhesion.

They are not only less likely to become immediately inflamed and to
suppurate, but also are much less liable to be accompanied by an unde-
tected injury of the skull or its contents, than most other wounds of the
scalp.   This circumstance results from two causes : *first*, the comparatively
small amount of force that is required to divide the cranial integuments
with cutting instruments; and, *secondly*, the superior facilities which the
clean edges and the open state of such wounds afford for determining their
real extent and depth, together with their complications.   They, there-
fore, as a rule, prove much less troublesome to manage than most other
wounds of the scalp.

In civil life incised wounds of the cranial integuments occur, for the
most part, in brawls or affrays, and are inflicted with knives or daggers,
of various sizes and shapes, with intent of doing bodily harm.   Occasion-
ally, however, they are inflicted with the sharp-edged tools of industry,
for example, scythes, chisels, axes, cleavers, etc., by accident or by de-
sign.   I have treated one case where the scalp was accidentally cut into
by the rebound of an axe, while its helve was in the patient's own hands,
however strange such an occurrence may seem.

In military life, incised wounds of the scalp usually present themselves
in the form of sabre-cuts and sword-thrusts ; and still it is quite remark-
able how seldom they occur in comparison to other wounds, even in time
of war.   The medical and surgical history of our war of the rebellion
gives but two hundred and eighty-two instances of incised scalp-wounds,
of which forty-eight were Confederates, mostly prisoners of war, while
it contains seven thousand, seven hundred and thirty-nine cases of gunshot
wounds, properly so-called, of the cranial integuments.   (*Op. cit.*, first
part, vol. ii. p. 1 *et seq.*)   During a period of about two years wherein
I was the surgeon in charge of Stanton Military General Hospital at
Washington, only four cases of incised scalp-wounds were treated there.
Three of them were captured Confederates held as prisoners of war, and
the other one was a Union soldier whose case will presently be related.
They all had sabre-cuts of the scalp, and all got well.   Each of their cases

is briefly given by Dr. Otis in the above-mentioned history of the late war. During a period of about two years altogether wherein I served with the Army of the Potomac in the field, at different times and places, among several thousand wounded examined by myself with much care, I saw but very few cases of incised scalp-wounds, so few that my field note-book makes scarcely any mention of them. It does, however, mention in some detail a rather interesting case of face-wound that came under my notice at Burk's Railroad Junction, in Southern Virginia, a point where about 2000 soldiers wounded in action during the last five or six days of the war, *i. e.*, between April 3d and April 9th, 1865, were received and cared for under my direction, until they could be sent forward to the De-pot Field Hospital of the Army of the Potomac at City Point, Va. The following is a transcript of the memorandum : April 10, 1865, I saw and examined a cavalry soldier, belonging to Gen. Sheridan's command, who had been wounded in the face by sabre-cuts on April 3d, *i. e.*, seven days ago, whereby he had received a long gash in each cheek. These wounds were already healed, union having taken place by primary adhesion. They had been closed with interrupted sutures, and had given the patient but little trouble, as they had not been swelled nor inflamed.

In the few instances of sabre-cuts of the head, which have passed under my observation, the cranium and encephalon proved to be unin-jured, the wounds themselves limited to the integuments, and it is believed that all of them resulted in a recovery that remained permanent. The following case was one of them, and as it serves to illustrate the nature, progress, and usual termination of this form of injury, together with the principles upon which its treatment should be conducted, it is here pre-sented to the reader :—

CASE IV. Private Joseph Yeagle, Co. L, 5th New York Cavalry, aged 32, was admitted to the Stanton U. S. Army General Hospital, at Wash-ington, June 25, 1863, having a sabre-cut on his head of considerable size, which he informed us was received in a hand to hand fight with the enemy's cavalry, at Middleburg, Va., four days previously, *i. e.*, on June 21st. On removing the dressing, which was the original one, it was found that the wound was a sabre-cut of the scalp only, and that it was doing well. The hair had been shaved off over a large space round the wound, its edges had been nicely coaptated, and then securely held in position by narrow strips of adhesive plaster, with a compress and retaining bandage placed over all. No sutures were employed. Pretty firm union had already taken place when he entered the hospital. It had occurred by adhesion, and without the formation of any purulent matter whatever. He complained of his head feeling full, and had a rather stupid look ; but his pulse was natural, tongue clean, appetite good, bowels regular, the scalp itself was but slightly swelled, and but little sore at the place of in-jury, and the cranium had not sustained appreciable lesion. Placed a few strips of plaster across the wound to support the cicatrix for a few days longer, and prescribed magnesia sulph. ℥j with a low diet. He made no further complaint, and his wound gave no further trouble.

June 29th. He was returned to duty cured, and there is good reason to belive that the cure was permanent.

Comments.—The principal danger to be apprehended in cases, such as the foregoing, is that the skull, or the encephalon, has sustained some undetected injury. The possibility that the cranium or the brain may receive some obscure injury from the weapon itself which can pass unrecognized for a considerable time is quite obvious. It is this circumstance that gives them most of their importance. The following observation made in the Crimean war illustrates this point : " John Dryden, 11th Hussars, received 31 wounds on 25th October, and was taken prisoner and treated in the Russian hospital at Simpheropol. In December, 1855, his wounds were healed up, and he was sent to Scutari, where he began to suffer from vertigo. He arrived in England on 6th April, 1856, and was discharged the service 22d May, still complaining of giddiness." (*Op. cit.*, vol. ii. p. 366.) The experience of our own army medical department vividly illustrates the same point. Of the 282 cases of sabre-cuts and sword-thrusts of the scalp mentioned above as having been reported during the war of the rebellion, 3 died from some form of encephalitis, 3 also died from complications, and 11 were more or less completely disabled, some from mental aberration, others from vertigo, impaired sight, headache, pains in the injured part, ptosis, and amaurosis. (*Op. cit.*, part first, vol. ii. p. 15.) Therefore, in all cases of incised wounds of the scalp, but especially those which are produced by sabres, axes, hatchets, and cleavers, the injured part should be closely examined, and the functions of the brain should be carefully interrogated by the surgeon, to the end that no lesion which ought to be discovered should, by any neglect, be overlooked.

The indications for the treatment of incised wounds of the cranial integuments are, in general, as follows : *First.* Arrest the hemorrhage which not unfrequently is profuse, by closing the mouths of the bleeding vessels with ligatures. Usually, the distal orifices must be tied as well as the proximal, because of the free inosculation which exists among the terminal branches of the arteries of the scalp. Styptics, such as liquor ferri persulph., etc., should not be used to stop such bleeding, because they would often fail, would always make the dressing of the wound more difficult, and retard the cure. *Second.* The hemorrhage being arrested the wound itself should be thoroughly explored with the finger, if possible, in order to determine whether the skull also is injured, and whether the wound contains any foreign body which should at once be extracted. *Third.* The hairy scalp should be denuded by shaving to a considerable distance from the wound on every side. The wound itself should be gently cleansed with tepid water, all blood-clots and hairs carefully removed, the neighbouring parts also washed clean, and then they should all be thoroughly dried with a soft napkin. *Fourth.* The oozing of blood from the cut surface having wholly ceased, the lips of the wound should be approximated,

accurately coaptated, and maintained in that relation with strips of isin-glass or adhesive plaster supported externally, if necessary, by a retentive bandage. The dressings should always be light. In most cases the employment of sutures is not advisable, because it is unnecessary, and might do harm.

Such patients make good recoveries under the simple treatment just described. In a considerable number of cases, however, the interrupted suture can be employed with positive advantage, and in a few cases it is indispensable. Whenever the hair-clad edges of the wound incurve a good deal, which not unfrequently happens, much better results are obtained by holding the lips of the wound together with sutures put in at a sufficient number of points, for by so doing the incurvation and its untoward results are entirely avoided. When the lesion of the scalp consists of a long flap-shaped cut the use of sutures is also very advantageous. Incised wounds of the scalp, especially when they are long and penetrate through it to the skull, are apt to gape widely on some parts of the head, from the elasticity of the injured structures and the looseness of the underlying connective tissue. In some cases of this sort the employment of interrupted sutures is indispensable. I have seen more than one example. At an early period in the after-treatment, i. e., on the second or third day, or as soon as the lips of the wound are securely glued together, the sutures and ligatures should all be taken out, because their presence tends to prevent the occurrence of union by the first intention. In healthy subjects, incised wounds of the cranial integuments, when treated on the plan above stated, almost always heal up at once. But in unhealthy subjects, or in those whose constitutions are broken down by intemperance, by want and exposure, by scurvy, or by the syphilitic cachexy, such wounds may suppurate and heal by granulation. Such cases always require a supporting kind of treatment with the exhibition of tonics and other remedies specially adapted to correct the constitutional vice upon which the local difficulty depends.

The following case will serve to show how very important it is in many instances for the surgeon to carefully explore even the incised forms of scalp-wounds for the purpose of finding foreign bodies that may be impacted therein, and extracting them :—

CASE V.—Patrick Develin, aged 40, by occupation a brewer, while attempting to walk in Eleventh Avenue, near Thirty-seventh Street, about 7 o'clock P. M., July 22, 1867, being considerably under the influence of drink at the time, tripped on the curbstone, and, staggering to about the middle of the street, fell heavily on his face across the track of the Hudson River Railroad, sustaining thereby a "severe cut," as his injury was called, i. e., an incised wound, of the forehead. He went to a drugstore in the neighbourhood, and there had his wound dressed. Two stitches were employed in sewing it up. On the eighth day afterwards, July 30, he was seized with lockjaw, and taken to Bellevue Hospital, where he died at $6\frac{1}{2}$ o'clock P. M., August 1, of that disease.

The coroner was called to the case, and Dr. Wooster Beach, his deputy, made an *autopsy*. He found that " there was a deep incised wound on the forehead, and at the bottom of this cut was a *small piece of wood;* the death resulted from this wound, but lockjaw or tetanus was the direct cause."

There is scarcely room for doubt that if the foreign body, the small piece of wood, had been removed from this man's scalp at the time his wound was sewed up at the drug-store, he would have got well. The lesson this case teaches is so plain that further comment is unnecessary.

One word more, however, concerning the employment of sutures to close up cuts of the scalp. I am satisfied from personal experience that they are much less hurtful than many suppose, provided they are not left in too long. For I have a good many times used the interrupted suture in dressing long cuts of the scalp that had been made by myself and others in performing surgical operations on these parts, and never saw any bad effect whatever resulting therefrom. The stitches, however, were always taken out at an early period, usually on the second or third day, rarely as late as the fifth day. The following example is in excellent point :—

CASE VI.—On November 9, 1874, I extirpated an ulcerating epithelioma for a delicate-looking lady of middle age, which was situated on the upper part of her forehead, near the hair-line, with the knife, by making two long curved incisions, one on each side of it, through the scalp down to the skull, laying bare the pericranium. This was done with a view to make sure of the removal of all the roots of the disease. The wound of operation was about three inches long, and gaped open to the extent of fully two inches, a space considerably wider than the piece removed. Having stanched the hemorrhage with ligatures, etc., I drew the lips of the wound well together with strong silken threads, passed deeply into the scalp at three points, one being in the centre and the other two midway between it and each angle of the wound, and securely tied them. The tension was very great, so great indeed that these three sutures would have inevitably been torn out, unless they had been planted very deeply. The coaptation was completed by applying long narrow strips of isinglass plaster across the wound on the spaces between the stitches, leaving the latter exposed to view. A thin, dry compress and a retentive bandage completed the dressing.

Visited the patient and looked at the wound every day. The cure progressed favourably in every respect. But little swelling and no redness appeared. Left the stitches undisturbed until the 14th, *i. e.*, five days after the operation, as they gave no trouble, and I feared the wound might reopen if they were withdrawn too soon. Then I cut them in two, and picked them out, leaving the plasters *in situ*. On the 20th, *i. e.*, eleven days after the operation, removed the plasters also, and found that the wound had completely healed, without suppuration, and with but a trifling scar.

Four years after the operation I heard from this lady, and learned that there had been no return of her disease.

5. *Punctured Wounds of the Scalp.*—This form of injury occurs much less frequently than most of the other traumatic lesions to which the in-

teguments of the head are exposed. The medical and surgical history of our war of the rebellion contains but eighteen cases of punctured scalp-wounds. " Nine were inflicted by sentinels, or received in broils or attempts to desert. Nine were received in action." (*Op. cit.*, part first, vol. ii. p. 30.) An examination of the record shows that all of them but one were produced by bayonets, and in that case, although the weapon is not stated, it was in all probability also a bayonet. Thus it is shown that in modern military life punctured wounds of the scalp are not only of very infrequent occurrence, but they are for the most part produced in one sole way, viz., by bayonet stabs. In civil life, however, punctured wounds of the cranial integuments are met with much oftener, and are produced in many different ways. They occur in accidents from falling down upon, or from running against, or from being struck by pointed objects of many different kinds, *e. g.*, fork-prongs, projecting nails, wooden splinters, broken glass, etc. They occur in affrays, from stabbing the head with ice-picks, pocket knives, scissors or shears, daggers, sword-canes, etc. In great maritime ports like New York, they often occur in broils among sailors, long-shore-men, and their associates, from stabbing the head with sheath-knives.

Punctured wounds of the head are frequently attended with punctured fracture of the cranium. The blow which sends some sharp-pointed body into the scalp, drives it also into the skull. For example, there occurred during the war of the rebellion, twenty-four cases wherein punctured wounds of the head were sustained. In six, *i. e.*, in one-fourth of them, there was also punctured fracture of the skull (*loc. cit.*, pp. 30, 33), whereof five proved fatal. In civil practice, likewise, punctured wounds of the head are found to involve the cranium as well as the scalp in a large proportion of instances. I can now recall to mind several cases of this sort. The first duty, then, of the civil as well as the military surgeon who has to treat what appears to be only scalp-wounds of a punctured character, is to determine on the spot whether the cranium also is injured ; or, in other words, whether in reality he has to deal with punctured fracture of the skull. Next, he should carefully explore the track of the wound in order to discover any foreign body which may be hidden therein, and promptly to extract the same. Some forms of punctured scalp-wounds are exceedingly apt to retain parts of the object which has produced them—for example, splinters of wood and fragments of glass that have been broken off and left impacted behind. Such cases should always be examined with very great care by the surgeon, lest through negligence he may allow that to remain in the wound which must inevitably occasion much trouble, and may even give rise to tetanus of a fatal character.

Punctured wounds of the scalp are more liable to be attended with the penetration of some artery of importance than punctured wounds of the integuments on any other part of the body, because the arteries of the scalp, surrounded as they are by the compact structures of the cranial in-

teguments, cannot glide away from the point of the instrument in a loose connective tissue, as the arteries may do in other portions of the organism, escaping penetration thereby.   Punctured wounds of the scalp are, therefore, very liable to be attended by a hemorrhage which is entirely out of proportion to the apparent magnitude of the wound.   This idea is well illustrated by what occurred in a case already mentioned—a remarkable case—wherein fatal hemorrhage from the left temporal artery took place upon its being penetrated in a wound received by falling against the small key of a book-case, *i. e.*, in a punctured wound of a contused and lacerated character.   In this case the conditions of the hemorrhage were such that Nature unaided could not stop it even for the time being, and no assistance coming, the man died from loss of blood.   When an important artery of the scalp has been simply opened or incompletely divided, as it is in the class of cases we are now considering, the hemorrhage is almost certain to continue until death is produced on the one hand, or it is arrested by the surgeon's art on the other ; for the coats of the wounded artery cannot contract around the bleeding orifice, nor retract themselves into the arterial sheath to such extent as to secure the lodgment of a plug of coagulum that shall stop the hemorrhage.   In all the cases belonging to this category the surgeon's duty is exceedingly plain.   He should proceed at once to tie the wounded vessel on both sides of the aperture in its walls, using of course two ligatures for that purpose.

Punctured wounds of the cranial integuments, especially when they extend obliquely to a considerable distance underneath, not unfrequently suppurate, and sometimes give rise to alarming symptoms in consequence thereof.   They may excite a suppurative inflammation in the loose connective tissue beneath the aponeurosis of the occipito frontalis muscle, and then, the matter wanting vent, burrows in that tissue, sometimes causing the aponeurosis itself to slough, or destroying the pericranium also, it denudes the skull to a great extent, and the inflammatory process, spreading through the cranium to the encephalon, produces encephalitis with all its dire results.   These destructive consequences of punctured wounds of the scalp may, however, in great measure be avoided by letting the purulent matter out as soon as formed ; and for this reason, the surgeon when treating injuries belonging to this category should always secure a free outlet for the pus at an early period, by promptly making free incisions through the scalp over the suppurating foci, and by repeating them as often as may become necessary from the spread of the morbid process.

Furthermore, it sometimes happens in cases of punctured and other wounds of the scalp, especially when the subject is unhealthy or his constitution is broken down by intemperance, scurvy, or constitutional syphilis, that the surrounding parts are affected with a destructive inflammation of a peculiar character, and become tumid, boggy, soft, infiltrated with thin, purulent matter, and sloughy, whereby an artery that has been injured is

opened by the ulcerative process, and dangerous hemorrhage results there-
from. A profuse flow of blood bursts from the ulcerated surface, perhaps
twelve, fifteen, or twenty days after the vessel has been injured, and, if
active means are not speedily adopted, the hemorrhage, by its recurrence,
may prove very dangerous. In such cases compression is of no avail ; the
bleeding may be staid for a time by this means, but upon the circulation
again becoming active, fresh hemorrhage must, and does take place ; the
parts around are infiltrated and engorged more and more, the blood escapes
in alarming quantities, and the patient is saved only by the occurrence of
syncope. To search for and discover the bleeding orifice by a clean dis-
section in such a case is impossible. In such cases, however, acupressure
applied on both the proximal and distal sides of the bleeding spot should
first be tried, and if this proceeding fails, the following should be adopted :
"A long and deep incision must be made through the swollen and diseased
parts in the course of the arterial branch, and a ligature passed under it,
on each side of the ulcerated point, by means of the common curved
suture-needle, or of one in a fixed handle. The ligatures should be at a
considerable distance from each other, in order that they may surround
healthy parts of the vessel ; after they have been firmly tied, all risk of
further hemorrhage is gone. Of course the ligatures should inclose as
little as possible of the parts surrounding the artery. A poultice is per-
haps the best application for a few days, and under its soothing influence
the effects of the continued compression, which had been previously em-
ployed, soon subside." (*Liston*.)

6. *Poisoned Wounds of the Scalp.*—The integuments of the human
head are peculiarly exposed to the envenomed stings of certain gregarious
members of the order *hymenoptera*—for example, honey-bees, wasps, hor-
nets, etc. The wounds thus produced consist of minute punctures, extend-
ing not unfrequently into the subcutaneous connective tissue, into which
there is injected an animal virus, or venom, of considerable potency. The
symptoms attending this kind of injury are mainly referable to the opera-
tion of this poison. They consist of burning pain in the wounded part of
a severe and persistent character, together with inflammatory swelling of
a strongly erysipelatous tendency. The pain follows the infliction of the
wound immediately, and the redness, heat, and swelling come on soon
afterwards.

Bee-stings of the cranial integuments, I am convinced from personal
experience, prove more troublesome and dangerous than bee-stings on any
other part of the body, except the mouth and fauces. Persons stung on
the head by bees, according to my observations, often show the constitu-
tional effects of the virus in a marked degree, the symptoms whereof are
debility, faintness, chilliness, trembling, cold sweating, dyspnœa, and
vomiting. In some rare instances bee-stings of the scalp have been found
to prove quickly fatal. Such cases are mentioned in the secular journals

every summer. For example, it was stated in the scientific column of a prominent daily, some months ago, "that an aged labourer in Wales was lately killed by the sting of a bee behind the ear." Again, it was stated in the same journal, at another time, that " a Mrs. Strong, the wife of a blacksmith, and the mother of several children, was stung by a honey-bee while picking apples in the orchard, and died from the effects of it in about ten minutes after going to her room. The poison took effect so rapidly that the head was swollen to twice its natural size in less than an hour." The medical journals also make mention of similar cases. For example, the *Lancet*, July 27, 1872, states that on July 19, a female, aged fifty-five, was stung by a bee behind the ear. Shortly afterwards she became unconscious, and soon died. Her brother testified at the inquest that she was of a nervous and delicate constitution; that in the autumn of 1870 she became unconscious, and remained in that state for two hours in consequence of having been stung by a bee. The *Lancet* (*loc. cit.*, pp. 135, 136) further says : " Dr. Tanner quotes a case from the *American Journal of the Medical Sciences*, of a man who suffered very seriously in the month of August, 1819, from the single sting of a bee, and who being stung a second time (on the temple) in the following year, died from the effects thereof within ten minutes. Two or three other cases of fatal result are quoted by the same author; but happily such an occurrence is exceedingly rare. The advice given by the coroner, Dr. Diplock, to give stimulants freely in such cases, is undoubtedly founded on sound principles, the immediate cause of death being apparently failure of the heart's action."

Again, the following case of rapid death from stings of bees, reported by Dr. J. O. Sanders, Carrolton, Mississippi, is quoted in *New Remedies* for 1873 (p. 157):—

" April 18, I was called to see a patient stung by bees. Mr. S., an intelligent man, gave the following account : Louis ——, a negro, aged about forty-five, climbed a tree where bees had swarmed on a limb, for the purpose of hiving them, carrying with him a saw. As soon as the limb commenced falling, the bees arose *en masse*, and covered his head and face. He descended immediately, and, as soon as he reached the ground, commenced running as fast as he could ; ran around three sides of a yard, some two hundred steps, passed through an open gate, and fell to the ground. Mr. S. ran to him with a bottle of spts. camphor, and succeeded in forcing him to take one swallow ; the patient protesting at the time against assistance, declaring that he would certainly die. After two or three irregular and partial respirations he expired. Mr. S. thinks it could not have been more than five minutes from the time he was attacked by the bees before he breathed his last. When I arrived, about an hour and a quarter after the accident, I could, on careful examination, find no signs of life. He was a vigorous, muscular man, and in perfect health, so far as I can learn. Was death due, in this case, to direct nervous shock, or to absorption of virus, or both ?"— *Medical News.*

The following case occurred under the personal observation of the writer :—

Case VII. *Multiple Bee-stings of the Scalp, accompanied by severe constitutional symptoms, and followed by Erysipelatous Inflammation of the Head and Face; Recovery.*—O. G. R., a robust young man, aged 22, a farm-labourer, while hiving a swarm of bees on the limb of an apple tree, was stung by them several times in the forehead. The injured parts immediately became the seat of intense burning pain and began to swell. The tumefaction increased rapidly and extended widely. The inflammation was diffuse in character, the skin dark red and hot. It soon extended to his face, and in a few hours his eyes were closed from tumefaction of the lids, his countenance became much distorted, and his ears involved in the morbid process. The stings, however, continued to be the principal seat of the pain, which remained severe and burning in character. The stingers had been left in the wounds by the insects.

He also exhibited decided evidences of constitutional disturbance. Soon after being stung he complained of feeling weak, faint, and chilly, and also vomited. This depressed condition of his system was followed by considerable reaction of a sthenic character. He then became feverish, thirsty, and restless. On the second day the erysipelatous inflammation of his head and face began to decline, and in a few days thereafter entirely disappeared, tarrying longest, however, at the wounds.

The remedial measures employed were of a simple nature. The stingers were extracted with tweezers, and then the affected parts were kept wet with a cold lotion which consisted of spirits of camphor and water. He kept his bed, and a dose of magnesium sulph. was administered after the fever came on.

In regard to the treatment of the stings of bees and other venomous insects the best plan is, after extracting the stingers, to apply liquor ammoniæ freely to the injured parts, with a view to decompose the venom and thus render it harmless. When the prostration due to absorption of the poison into the system is considerable, a few drops of the ammonia mixed in water should be administered by the mouth; and when it is very great the ammonia should be administered hypodermically, in sufficiently large doses to prevent the occurrence of cardiac paralysis. The diffuse inflammation of the injured parts generally requires the application of cold lotions, of which the lead and opium wash is one of the best.

46 Washington Square, January 1, 1879.

Article II.

Experiments and Reflections upon Animal Heat. By Austin Flint, Jr., M.D., Professor of Physiology and Physiological Anatomy in the Bellevue Hospital Medical College, New York, etc. etc.

Having had occasion recently to study the question of the force-value of food in connection with investigations into the source of muscular power, and the laws of conservation of force as applied to the theories of muscular action, I became much interested in the subject of animal heat. The

theories of the mechanism of the production of heat by animals have lately assumed a very positive and definite form ; and certain statements are now presented as facts, which appear to be entirely satisfactory to many physiologists. The question involved is one of great pathological as well as physiological importance. It is well known that the temperature of the deeper parts of the body, which are little exposed to external refrigerating influences, does not vary in health more than two or three degrees Fahrenheit, and that this temperature is, to a great extent, independent of that of the surrounding atmosphere. When, from any cause, whether it be external or internal, there is a tendency to an elevation of the animal temperature, the heat is kept at the normal standard mainly by evaporation from the surface of the skin. There is, indeed, a constant generation of heat within the body, which is sufficient to maintain the animal temperature and to compensate the loss of heat from the surface. It is evident that this internal production of heat is connected with the general process of nutrition, and that it must involve changes in the form of matter within the animal organism. Carbonic acid is constantly discharged from the body, and this is one of the most important products connected with changes in matters, which produce heat. The body as constantly consumes oxygen, and oxidation is a process connected with most of the changes involved in calorification.

It is evident that, in normal nutrition by food, the heat of the body must be maintained by changes which take place, either directly in the blood or indirectly in the tissues, in the alimentary matters, and that these changes involve oxidation to a very considerable extent. Under ordinary conditions of nutrition, it is assumed that the food furnishes all the material for maintaining the heat of the body and for the development of force in work such as the muscular work of respiration and circulation and general muscular effort. If no food be taken for a certain time, the heat of the body must be maintained and the work must be accomplished at the expense of the substance of the body itself, and the individual loses weight.

To furnish a positive scientific basis for the views above expressed, physiologists have burned various articles of food in oxygen and have thus calculated their heat-value. This has been expressed in what are called heat-units, the English value of a heat-unit being the amount required to raise one pound of water one degree of the Fahrenheit scale. It is also calculated that one heat-unit converted into force will raise 772 pounds one foot high, or is equal to 772 foot-pounds. The theory of the heat-value and the force-value of food, based upon these premises, is the following :

The heat-value of food may be expressed in a definite number of heat-units. A certain proportion of these heat-units serves to maintain the standard animal temperature. A certain proportion is converted into the

force used in the muscular work of respiration and circulation. A certain proportion is used in ordinary muscular work. If the supply of food be in excess of these various requirements, a certain part of it is not used and the body may gain in weight. If the supply of food, however, be below the demands of the system, a part of the tissues of the body itself is consumed, and there must be a loss of weight.

There is no objection to such a theory as the one just stated on the ground of want of simplicity or comprehensiveness; but it must be admitted that many of its essential propositions are of necessity wanting in accuracy. Suppose that it be assumed as true, for the sake of argument, that one heat-unit is capable of being transformed in the body into 772 foot-pounds of force. It must be proven that a certain definite amount of heat is produced by the body. A reasonably accurate estimate must be made of the force consumed in the muscular work of respiration and circulation, expressed in foot-pounds. The general muscular work of the body must also be computed in foot-pounds.

I do not propose to discuss, in this connection, the last two propositions, and I think I have shown, in another place, the enormous errors that exist in the calculations by which the muscular work of the body has been reduced to foot-pounds.[1]

I shall discuss, in this essay, the estimated heat-value of certain articles of food and experiments made with reference to the heat-units actually produced by the body. I shall then give an account of observations made upon my own person, in which I endeavoured to ascertain something definite with regard to the relations between the heat estimated as produced by the body, the loss of weight of the body during one day's abstinence from food, and the estimated heat-value of a carefully weighed quantity of food taken during one day.

Estimated Heat-value of certain Articles of Food.—Following the observations made by Fick and Wislicenus, in 1866, by which these observers attempted to show that nearly all the force resulting from muscular action is due to the oxidation of non-nitrogenized matters, physiologists have estimated the heat-value and the force-value of different articles of food. They have reasoned that the food, by its oxidation in the body, is capable of producing a certain amount of heat and that a part of this heat is converted into force. A method now employed to calculate the heat produced is to subtract the daily mechanical force expended from the total force-value of the food, the result giving the daily formation of heat. A recent writer estimates in this way that " between one-fifth and one-sixth of the total income is expended as muscular labour, the remaining four-fifths or five-sixths leaving the body in the form of heat."[2] The reduction of heat-units to units of force is made in accordance with Joule's formula, that one

[1] A. Flint, Jr., Source of Muscular Power, New York, 1878.
[2] Foster, Text-Book of Physiology, London, 1877, p. 323.

heat-unit (the heat required to raise the temperature of one pound of water one degree Fahrenheit) is equal to 772 foot-pounds, or will raise 772 pounds one foot high.

In 1866, Frankland made a number of calculations of the heat-units and the estimated force-value of various articles of food[1] which are now accepted and used by most writers upon subjects connected with the theories of animal heat and the source of muscular power. The experiments upon which these calculations are based were made with great care and exactness. The following quotation gives, in a few words, the method employed:

"In order to estimate the amount of actual energy generated by the oxidation of a given amount of muscle in the body, it is necessary to determine, first, the amount of actual energy generated by the combustion of that amount of muscle in oxygen, and then to deduct from the number thus obtained the amount of energy still remaining in the products of oxidation of this quantity of muscle which leave the body. Of these products, urea and uric and hippuric acids are the only ones in appreciable quantity which still retain potential energy on leaving the body, and of these the two latter are excreted in such small proportions that they may be considered as urea without introducing any material error into the results.

"These determinations were made in Lewis Thompson's calorimeter, which consists of a copper tube to contain a mixture of chlorate of potash with the combustible substance, and which can be inclosed in a kind of diving-bell, also of copper, and so lowered to the bottom of a suitable vessel containing a known quantity (2 litres) of water. The determinations were made with this instrument in the following manner: 19.5 grams of chlorate of potash, to which about $\frac{1}{4}$th of peroxide of manganese was added, was intimately mixed with a known weight (generally about 2 grams) of the substance whose potential energy was to be determined, and the mixture being placed in the copper tube above mentioned, a small piece of cotton thread, previously steeped in chlorate of potash and dried, was inserted in the mixture. The temperature of the water in the calorimeter was now carefully ascertained by a delicate thermometer, and the end of the cotton thread being ignited, the tube with its contents was placed in the copper bell and lowered to the bottom of the water. As soon as the combustion reached the mixture a stream of gases issued from numerous small openings at the lower edge of the bell and rose to the surface of the water, a height of about ten inches.

"At the termination of the deflagration, the water was allowed free access to the interior of the bell, by opening a stopcock connected with the bell by a small tube rising above the surface of the water in the calorimeter. The gases in the interior of the bell were thus displaced by the incumbent column of water, and by moving the bell up and down repeatedly a perfect equilibrium of temperature throughout the entire mass of water was quickly established. The temperature of the water was again carefully observed, and the difference between this and the previous observation determines the calorific power or potential energy, expressed as heat, of the substance consumed.

"The value thus obtained is, however, subject to the following corrections:—

"1. The amount of heat absorbed by the calorimeter and apparatus employed, *to be added.*

"2. The amount of heat carried away by the escaping gases, after issuing from the water, *to be added.*

"3. The amount of heat due to the decomposition of chlorate of potash employed, *to be deducted.*

"4. The amount of heat equivalent to the work performed by the gases generated in overcoming the pressure of the atmosphere, *to be added.*"[2]

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[1] Frankland, On the Origin of Muscular Power.—Philosophical Magazine, London, 1866, vol. xxxiii., p. 182 *et seq.*

[2] Frankland, in Bence Jones, Croonian Lectures on Matter and Force, London, 1868, p. 141 *et seq.*

It is evident that the determinations made in the manner above described, care being taken to make the corrections indicated (which can be done without difficulty), give the amount of heat produced by the simple burning of the articles employed. As regards the heat produced by the oxidation of these substances in the body, if it be assumed that the same quantity of heat is produced by the oxidation, under all circumstances, of a definite amount of oxidizable matter, it is necessary simply to deduct from the heat-value of articles of food the heat-value remaining in the certain parts of the food which pass out of the body in an unoxidized state. It was in this way that Frankland arrived at a determination of the heat-value of articles of food oxidized in the body.

Estimated amount of Heat actually produced by the Body.—In January, 1872, Senator made an elaborate series of observations upon dogs, in which he attempted to ascertain the actual quantity of heat produced by the body per hour per kilogramme of body-weight. The principle upon which these observations were made was essentially the same as that which underlies the experiments of Frankland upon the amount of heat produced by the oxidation of alimentary matters. The animals experimented upon by Senator were inclosed in a copper cage which corresponds to the bell of copper in Thompson's calorimeter. The cage was supplied with a current of air, the temperature of which was carefully noted as it entered and passed out. The apparatus was immersed in a known volume of water, the temperature of which was noted at the beginning and at the close of each observation. The so-called combustion processes taking place in the body of the animals correspond to the deflagration of the alimentary substances in Frankland's experiments. The variations in the temperature of the animals and the loss of heat by the cooling of the apparatus itself were noted and used as corrections. In five experiments, the animals remaining in the apparatus for one hour in each observation, the gain in temperature of the water, all the necessary corrections being made, gave an average of 12.63 heat-units for an average weight of the animals of 5.383 kilogrammes;[1] that is to say, the increase in temperature of the water surrounding the cage in which the animals were inclosed was equal to 12.63° C. for each kilogramme of water. Reducing these results to the heat-units produced per kilogramme of weight of the body of the animal, there was a production of 2.34 heat-units per kilogramme of weight. The heat-unit calculated by Senator represents the raising of one kilogramme of water one degree Centigrade. One degree Centigrade equals 1.8° Fahrenheit. Reducing the heat-units, therefore, to the Fahrenheit scale, we should have the 2.34 heat-units equal to 4.212 heat-units Fahren-

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[1] Senator, Untersuchungen über die Wärmebildung und den Stoffwechsel.—Archiv für Anatomie, Physiologie, und Wissenschaftliche Medicin, Leipzig, 1872, S. 20. In Senator's experiments, estimates were made of the exhalation of carbonic acid during each observation which I do not introduce into the discussion.

heit.   As the heat-units used by Senator are per kilogramme of weight of
the body and per kilogramme of water, the figures are the same when we
make the calculation for a pound of water and a pound weight of the body.
Reduced to heat-units representing the raising of one pound of water one
degree Fahrenheit for each pound of weight of the body, we have, as the
result of Senator's observations, a production of 4.212 heat-units per hour
per pound of body-weight.

In December, 1872, Dr. John C. Draper, of New York, made a series
of observations upon his own person, similar to those of Senator upon dogs.
In these observations, he lay for one hour in a bath of a known volume of
water.   After making the necessary correction for the absorption of heat
from the atmosphere by the water, which was $\frac{1}{2}°$ Fahr., he ascertained
that he warmed "seven and one-half cubic feet of water two degrees in
one hour."   He estimated the volume of the body at three cubic feet,
from which he calculated that "enough heat is evolved in the course of
one hour to warm the body itself about five degrees of Fahrenheit's scale."[1]
Two experiments made in this way on two successive days gave identical
results.   In both of these experiments, the temperature in the mouth on
entering the bath was 99° Fahr.   After one hour in the bath, the tem
perature in the mouth was 98° Fahr., showing a reduction in the tempera-
ture of the body of one degree.   The temperature of the water at the be-
ginning of the experiment was 74°.   I shall assume, therefore—though
this correction was not made by Draper—that, of the five degrees calcu-
lated as gained by three cubic feet of water and derived from the body,
one degree was due to the cooling of the body, leaving four degrees of
heat actually produced by the body in the hour.   A given weight of the
body being capable of warming an equal weight of water four degrees
Fahrenheit in one hour, it follows that the body produces four heat-units
per pound per hour, the heat-unit representing the raising of one pound
of water one degree Fahrenheit.

The results obtained by Draper correspond very closely with those
given by Senator.   There is no reason to doubt the accuracy of the obser-
vations of either of these experimenters.   It may be objected to Draper's
experiments that the body in a bath is not under conditions absolutely
physiological; but the condition of the dogs in Senator's experiments was
not so abnormal as to seriously impair the value of his conclusions.   In the
applications which I shall make of the results of these experiments to my
own observations, I shall assume that the body produces four heat-units
per pound weight per hour.

In the same way it may be assumed that there is no reason to doubt
the accuracy of Frankland's observations showing the heat-units produced
by the oxidation of various articles of food.   I shall therefore regard the

[1] Draper, The Heat Produced in the Body, and the Effects of Exposure to Cold.—
American Journal of Science and Arts, New Haven, December, 1872.

determinations made by Frankland as definite propositions in the discussion which is to follow.

Conversion of Heat into Force in the Body.—In 1842, Dr. J. R. Mayer published an essay on the forces of inorganic nature, which is regarded as the starting point of the modern theories of the correlation and conservation of forces. These theories, which were at first applied to the forces developed by chemical changes in inorganic matters, have recently been applied to the production of heat and the development of force in animal bodies. It is not surprising that the theory alluded to should be thus applied. Physiologists have long been seeking for an expression of the phenomena of animal heat and force in definite quantities, and they have endeavoured to show that these phenomena are in accordance with certain laws which are applicable to the inorganic world. With our present knowledge, the idea of the actual generation or the total destruction of a single atom of matter is inconceivable. Matter changes its form, its characters, and the arrangement of its elementary constituents; but matter itself is indestructible. It is impossible, also, to conceive of force without matter. Philosophers regarding matter as indestructible, the idea of the indestructibility of force naturally follows; and, as matter undergoes changes by different arrangements of chemical elements, may there not be different kinds of manifestation of force which are interchangeable and interconvertible? The first step in the formulization of such an idea is the establishment of a unit of force which can be used to represent all dynamic manifestations; and the simplest way in which this can be expressed or defined is to measure all force by the power required to raise a certain weight a certain distance above the surface of the earth. We therefore express our idea of the quantity of any force in the raising of a given number of pounds to the height of a certain number of feet.

It is evident that the heat developed by chemical changes may be used in the production of power. We are in the habit of measuring heat by the expansion of some substance, such as mercury, and this is reduced to the degrees of an established scale. English writers have fixed upon a definite unit of heat, which is the amount required to raise one pound of water one degree in the Fahrenheit scale.

We thus have two fixed quantities to give form to our ideas of heat and force; a heat-unit, which equals one pound of water raised one degree Fahrenheit, and a unit of force, which equals one pound weight raised one foot high.

The line of reasoning adopted by Mayer is briefly the following:[1] An effect has a cause. Force is a cause which may produce a certain effect. A body cannot fall to the earth without having been raised to the height

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[1] Mayer. The Forces of Inorganic Nature.—Correlation and Conservation of Forces, New York, 1868, p. 251 *et seq.*

from which it falls. The cause c has an effect e, which effect may itself act as a cause and produce a second effect f.

"If the given cause c has produced an effect e equal to itself, it has in that very act ceased to be: c has become e; if, after the production of e, c still remained in whole or in part, there must be still further effects corresponding to this remaining cause: the total effect of c would thus be $> e$, which would be contrary to the supposition $c = e$. Accordingly, since c becomes e, and e becomes f, etc., we must regard these various magnitudes as different forms under which one and the same object makes its appearance. This capability of assuming various forms is the second essential property of all causes. Taking both properties together, we may say, causes are (quantitatively) *indestructible* and (qualitatively) *convertible* objects."

The line of reasoning followed by Mayer leads him to conclude that, the force exerted by a falling body ("falling force") being equal to the force which has raised the body to the height from which it has fallen, this "falling force" itself acts as a cause and produces an effect. The first cause c equals the effect e, and the effect e, acting as a cause, equals the second effect f. $c = e = f$. Consequently, $f = c$. The effect f is expressed in an elevation of temperature. The first cause c finally produces f; and, as the falling of a definite weight a certain distance produces a definite amount of heat, the heat thus produced is equal to the force required to raise the weight to the height from which it has fallen. The following are the conclusions arrived at by Mayer by this course of reasoning.

"By applying the principles that have been set forth to the relations subsisting between the temperature and the volume of gases, we find that the sinking of a mercury column by which a gas is compressed is equivalent to the quantity of heat set free by the compression; and hence it follows, the ratio between the capacity for heat of air under constant pressure and its capacity under constant volume being taken as $= 1.421$, that the warming of a given weight of water from 0° to 1° C. corresponds to a fall of an equal weight from the height of about 365 metres.[1] If we compare with this result the working of our best steam engines, we see how small a part only of the heat applied under the boiler is really transformed into motion or the raising of weights; and this may serve as justification for the attempts at the profitable production of motion by some other method than the expenditure of the chemical difference between carbon and oxygen—more particularly by the transformation into motion of electricity obtained by chemical means."

In an essay upon the "Correlation of Physical Forces," by Grove, is a very clear and succinct account of the experiments of Joule,[2] whose results are those most generally adopted and used at the present day:

"Mr. Joule has made a great number of experiments for the purpose of ascertaining what quantity of heat is produced by a given mechanical action. His

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[1] The above reduced to a degree of Fahrenheit and to feet gives the following: One heat-unit Fahrenheit, or one pound of water raised one degree Fahrenheit, equals one pound weight raised to the height of 665 feet, or 665 foot-pounds.

The following note is added by the translator of Mayer's essay:

"When the corrected specific heat of air is introduced into the calculation this number is increased, and agrees then with the experimental determinations of Mr. Joule."

[2] Joule's original essay is in the Philosophical Transactions, 1850, p. 61, and is entitled "On the Mechanical Equivalent of Heat."

mode of experimenting is as follows: An apparatus formed of floats or paddles of brass or iron is made to rotate in a bath of water or mercury. The power which gives rise to this rotation is a weight raised like a clock-weight to a certain height; this by acting during its fall on a spindle and pulley communicates motion to the paddle-wheel, the water or mercury serving as a friction medium and calorimeter; and the heat is measured by a delicate mercurial thermometer. The results of his experiments he considers prove that a fall of 772 pounds through a space of one foot is able to raise the temperature of one pound of water through one degree of Fahrenheit's thermometer. Mr. Joule's experiments are of extreme delicacy—he tabulates to the thousandth part of a degree of Fahrenheit, and a large number of his thermometric data are comprehended within the limits of a single degree. Other experimenters have given very different numerical results, but the general opinion seems to be that the numbers given by Mr. Joule are the nearest approximation to the truth yet obtained.''[1]

I have thus given as plain a statement as I could make of the experiments upon which the prevailing theories of the mechanical equivalent of heat are based. The experimental fact involved is the production of heat by force. Algebraically, the equations seem unquestionable. Cause = effect; effect acting as a second cause = a second effect, which is heat; consequently the first cause, which is a definite amount of force, = the second effect, which is a definite amount of heat, and conversely the heat = the force. The experimental demonstration is the production of a certain quantity of heat by falling force, but never the production of the same amount of force by the heat. We can readily understand how there must be, in machinery constructed to produce force by heat, as in a steam-engine, such a waste of heat as to actually give much less useful force than is really equivalent to the heat employed. Viewed in this way, the question rests within the province of pure physics; but when the law of the correlation and conservation of forces is applied to animal mechanics, it is not difficult to see that the argument is entirely one-sided. The operations involved in the theory under consideration are simply two; viz., the production of animal heat and muscular force, the latter including the force used in circulation and in the movements of respiration. In animal mechanics, heat is never produced by force, but it is the theory that force results from a transformation of the heat remaining after sufficient heat has been produced to keep up the constant animal temperature. According to the present theory, physiologists must always reason in one direction, from the transformation of heat into force, while the physical basis of the theory consists of experiments in an opposite direction, the transformation of force into heat. Looking at the question in its relations to physiology, while I cannot say that, in an equation, if $a = b$, the converse, $b = a$, is not a self-evident proposition, I am not prepared to admit, without some experimental proof, the theory that one heat-unit produced in the animal body is equivalent to 772 foot-pounds of force. I fully appreciate the seeming temerity of an expression of want of perfect faith in the

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[1] Grove, Correlation of Physical Forces.—The Correlation and Conservation of Forces, New York, 1868, p. 33.

doctrine of the convertibility of a certain quantity of heat into a definite quantity of force in animal bodies. It is enough to say that this dogma is accepted by Helmholtz, Faraday, Liebig, Carpenter, and, indeed, by nearly all modern philosophers. But, will this theory accord with all established physiological facts? This is the question that I propose to discuss, carefully considering the experimental basis of the facts that I shall bring forward, and allowing, in my discussion of these facts, for all elements of possible error and inaccuracy. The following propositions, which I make in advance of my discussion, I shall attempt to sustain by experiments quite as positive in their results as those of Mayer and of Joule:

1. While experiments have shown that the fall of 772 pounds through a distance of one foot, or the fall of one pound through a distance of 772 feet, will produce a quantity of heat that will raise the temperature of one pound of water one degree Fahrenheit, there is no positive experimental proof that such a quantity of heat will raise 772 pounds one foot, or one pound 772 feet.

2. The application to animal physiology of the law that one heat-unit is equal to 772 pounds of force is by no means a logical necessity. It is not adequately supported by experimental facts, partly for the reason that there are no accurate formulæ which will enable us to express the force used in circulation, respiration, and general muscular effort in definite units such as foot-pounds.

The experiments of Frankland, which I have already discussed, show that certain articles of food, when oxidized, produce a certain quantity of heat. It may be assumed that the amount of heat thus produced will always be the same whether the oxidation be slow or rapid. Animal heat and the force exerted by the body must be derived, directly or indirectly, from food. The quantity of food taken within a certain time can be measured, and the heat-value of such food may be determined. If the food taken can be shown to possess a heat-value which is manifestly in excess of the total ascertainable heat and force developed in the body, we can understand how a certain amount may pass away in such a manner that we cannot with certainty determine how it is lost. Experimental methods in physiology are not so exact as to enable us to follow all the changes which take place in the body, as is well known. But if, on the other hand, the estimated heat-value of food should fall far short of accounting for the heat and force generated in the body, there would seem to be a fatal error either in the law or in its application.

Experiments have been made by precisely the same methods as those by which the heat-value of articles of food has been established, showing that a warm-blooded animal or a man produces a definite amount of heat per hour per pound weight of the body. These experiments I have already discussed. There is no more reason to doubt their accuracy than

there is to question the results of the experiments of Frankland upon the heat-value of articles of food. In order to show that the application of the law of the relations between heat and force to animal mechanics is correct and that the law itself is correct, we must, as a logical necessity, be able to account for the heat and force developed in animal bodies by the heat-value of food, or of body-weight consumed, when the food is insufficient. If we have correctly estimated the heat-value of food, if we have also correctly estimated the heat and force developed in the body, there must be an error in the calculated relations between heat and force, if physiological facts do not sustain our theory. A serious defect in the theory that a certain amount of heat is equal to a certain amount of force is that no one has been able to show the actual conversion of one heat-unit into any number approaching that of 772 foot-pounds of force.

Observation 1.—In 1870, I had occasion to note the work, the quantity of food taken, and various other conditions, in a healthy man for several consecutive days. The observations were made at that time with another object in view; but the data obtained will serve in the present argument. I shall here make use of the estimates made for five consecutive days.

During the five days, the total amount of nitrogen in the food was 1173.82 grains. It is estimated by Dr. Pavy,[1] according to the observations of Frankland, that one ounce (437.5 grains) of dry albuminous matter, as consumed within the body, is equal to 165.20 foot-tons of force. Dr. Pavy computes, from Mulder's analysis, that 15.5 is the percentage of nitrogen in dry albuminous matter. According to this computation, 1173.82 grains of nitrogen represent 7573.03 grains, or 17.31 ounces of dry albuminous matter. During these five days, there was a loss of body-weight of 3.45 pounds. The subject of the experiment walked $317\frac{1}{2}$ miles in the five days, and, at the beginning of the walk, had no appreciable fat. I therefore estimated the loss of weight as muscular tissue and calculated it as equal to 724.5 grains of nitrogen, equivalent to 4674.20 grains, or 10.68 ounces of dry albuminous matter.[2] The total force-value, then, of nitrogenous food and of loss of body weight (27.99 ounces of dry albuminous matter) was 4623.95 foot-tons, or 10,357,648.00 foot-pounds, equal to 13,416.64 heat-units.

I carefully estimated, for the five days, the heat-value of the non-nitrogenized food (milk, bread, oatmeal, potatoes, butter, and sugar). The heat-value of this food, calculated from Frankland's tables, amounted to 19,521.41 heat-units.

The following gives the total heat-value of the food and loss of body weight for five days :—

	Heat-units.
Nitrogenized food and loss of body weight . . .	13,416.64
Non-nitrogenized food	19,521.41
Total sources of heat give	32,938.05

The observations of Senator upon dogs and those of Draper upon his own person show that the actual quantity of heat produced by the body

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[1] The Lancet, Dec. 16, 1876, p. 849.

[2] According to Payen, lean meat, uncooked, or muscular tissue, contains three per cent. of nitrogen. (Payen, Substances alimentaires, Paris, 1865, p. 488.)

is equal to at least four degrees Fahrenheit per pound weight per hour, which gives ninety-six degrees per pound weight for twenty-four hours. The subject of my observations had an average weight, for five days, of 115½ pounds. He consequently produced 11,088 heat-units in twenty-four hours, and 55,440 heat-units in the five days. The estimate of four degrees per pound per hour is for perfect repose. If this estimate be correct for repose, the subject of my experiment must have produced much more heat during the exertion of walking 317½ miles in five days. Taking the estimate of four degrees, however, we have the following:—

Heat-units produced by the body in five days	55,440.00
Heat-value, in heat-units, of food and loss of body weight	32,938.05
Heat-units unaccounted for	22,501.95

In the above calculation, no account is taken of the force exerted in walking 317½ miles or of the force employed in circulation and respiration. The estimates of the amount of force used in circulation and respiration are of necessity merely approximative. According to Letheby, it amounts to about 600,000 foot-pounds per day,[1] or 3,000,000 foot-pounds in five days, which equal 3886.00 heat-units. It is even more difficult still to estimate the force used in walking 317½ miles. An estimate has been made, however, of the force used in walking on a level, by Prof. Haughton. This estimate is that the work accomplished is equal to raising one-twentieth of the weight of the body through the distance walked, assuming the rate of speed to be three miles per hour.[2] For sake of argument I shall use this estimate, although I have little confidence in its accuracy, and the rate of speed in walking the 317½ miles was between four and one-half and five miles per hour instead of three miles. The force, then, in walking 317½ miles was equal to 4321.33 foot-tons,[3] or 9,679,779.20 foot-pounds, equivalent to 12,538.57 heat-units. Taking all of these estimates, the total heat-units expended in five days would be as follows:

Heat-units produced (animal heat)	55,440.00
Heat-units converted into force, expended in walking 317½ miles (estimated)	12,538.57
Heat-units converted into force expended in circulation and respiration (estimated)	3,886.00
Total expended in five days	71,864.57
Total heat-units derived from all kinds of food and from loss of body weight	32,938.05
Unaccounted for	38,926.52

Taking the heat produced by the body in maintaining the standard temperature for five days as 55,440.00, and the total heat-value of all kinds of food and of loss of body weight as 32,938.05, we have about forty per cent. of the heat produced which cannot be accounted for in the estimates that I have given. Adding to the heat produced by the body the estimated heat-units converted into force and used in walking 317½ miles and in keeping up circulation and respiration, we have a total of 71,864.57

[1] Letheby, On Food, New York, 1872, p. 96.

[2] Haughton, Principles of Animal Mechanics, London, 1873, p. 57.

[3] A. Flint, Jr., The Source of Muscular Power, New York, 1878, p. 63.

heat-units, of which about fifty-five per cent. cannot be accounted for by the estimated heat-value of the food and of the loss of body weight.

These results are certainly most striking. It is admitted by those who adopt the theory that one heat-unit is equal to 772 foot-pounds, that in a machine, like a steam-engine, but a small fraction of the calculated value of the heat employed can be actually used or measured as force. As regards this fact, we are satisfied with the explanation that a large amount of heat is necessarily wasted. But suppose, instead of this, we burned coal in a steam-engine, the heat-value of which was equal to 12,000 heat-units, and produced thereby an amount of force (calculating that one heat-unit equals 772 foot-pounds) represented by 20,000 heat-units, leaving 8000 heat-units, or forty per cent. of the force actually produced, unaccounted for. In the face of such a demonstration, the theory that one heat-unit equals 772 foot-pounds would fall to the ground. Provided the experiments be correct, the same process of reasoning may properly be applied to the physiological problem. We start with the assumption that the oxidation of a definite amount of matter produces a definite amount of heat, be the process slow or rapid or be it in the animal machine or in a calorimeter. All food has a determinable heat-value. But the heat-value of the food compared with the amount of heat actually produced in the body in a given time leaves forty per cent. of the heat actually produced which cannot be accounted for. This large deficiency demonstrates the existence of some serious error which may be expressed in one or more of the following propositions :

1. There may be an error in calculating the heat-value of the articles of food.

2. It may be an error to assume that the heat-value of the changes which the food undergoes in the body is equal to the heat-value as calculated by experiments with the calorimeter.

3. There may be an error in the estimates of the amount of heat actually produced by the body.

If errors exist in any or in all of these propositions, they are very considerable.

Suppose, again, that we add to the heat used in maintaining the temperature of the body the heat-units converted into the force required for work. We have, of the heat-units required for all these processes, fifty-five per cent. unaccounted for. Added to the errrors to be looked for in reasoning from the animal heat alone and taking no account of the work, we have possible errors which may be expressed in the following propositions :

1. There may be an error in assuming that one heat-unit equals 772 foot-pounds.

2. Assuming that there is no error in the first proposition, it may be

incorrect to assume that the value of the transformation of one heat-unit into force in the body is equal to 772 foot-pounds.

3. There may be, and there probably is, a considerable error in the formula by which the work of walking on a level is reduced to foot-pounds.

4. There may be, and there probably is, a considerable error in the estimate of the force used in circulation and respiration.

Observation 2.—Nov. 22, 1878, I began the following experiment, in which I fasted for twenty-four hours:

Nov. 22d. 5.10 P. M., I had an alvine dejection. 6.45 P. M., I dined heartily. 10.45 P. M., I ate three poached eggs and toast and drank half a pint of Bass's ale. I slept well during the night.

23d. 7.45 A. M., I emptied the bladder but failed to have a passage from the bowels. 8 A. M., I began my observations, having taken no food since 10.45 P. M. of Nov. 22. My body-weight, without clothing, was 188¼ pounds. The temperature under the tongue, taken for five minutes, was 99° Fahr. I walked half a mile. 9 A. M., I drank 8 fluidounces of water. 10 A. M., I played at billiards for two and one-half hours and drank 8 fluidounces of water. 1.30 P. M., I walked a quarter of a mile. 2 P. M., hunger was quite distressing, but it was relieved by smoking. 3.30 P. M., I walked about a quarter of a mile. 4 P. M., I had hardly any sense of hunger. The temperature under the tongue, taken for five minutes, was 98⅔° Fahr. 5.30 P. M., I played at billiards for one hour. 7.30 P. M., I drank 4 fluidounces of water. I went to the theatre in the evening and walked about a quarter of a mile. 11.15 P. M., the temperature under the tongue, taken for five minutes, was 99⅝° Fahr. I slept rather uneasily during the night.

24th. 7.45 A. M., I emptied the bladder but could not secure an operation of the bowels. 8 A. M., the experiment was concluded. The body-weight, without clothing, was 184¾ pounds. The temperature under the tongue, taken for ten minutes, was 97¾° Fahr. I had fasted for about thirty-three hours, but I calculated the fast from 8 A. M., Nov. 23, to 8 A. M., Nov. 24, for twenty-four hours after digestion had probably been completed. I suffered from hunger only at about 11 A. M., 2 P. M., and 7 P. M., the hours when I habitually took food. The suffering from hunger was less than I had anticipated and was much relieved by smoking three cigars during the day, smoking very frequently and but little at any one time. It is proper to state that I am forty-two years of age, five feet ten and one-half inches in height, and that I have been in the habit of daily muscular exercise in a gymnasium for the past ten years. I have a rather unusual muscular development. The weather had been fair and partly cloudy, with a temperature of 45¼° Fahr., an average of eight observations.

The urine passed during the day was collected and analyzed, with the following results:

Total quantity, 34 fluidounces. Reaction acid; colour and odour normal; specific gravity 1023½; no albumen; no sugar; nothing abnormal on microscopical examination.

An analysis of the urine was made by Dr. C. A. Doremus for urea and uric acid. The urea was estimated by Liebig's process, the standard solution having been carefully treated with pure urea. The uric acid was estimated by treating the urine for forty-eight hours with hydrochloric acid, all the corrections being carefully made. The results of these examinations were as follows:

Urea, 14.78 grains per fluidounce = 502.52 grains in twenty-four hours = 234.51 grains of nitrogen.   Uric acid, 0.255 of a grain per fluidounce = 8.67 grains in twenty-four hours = 2.89 grains of nitrogen.[1]

The total quantity of nitrogen contained in the urea and uric acid eliminated in the twenty-four hours was 237.4 grains.   It is estimated by Dr. Pavy, according to Frankland's observations, that one grain of urinary nitrogen is equivalent to an amount of nitrogenized tissue consumed which would produce 2.4355 foot-tons of force, or 7.067 heat-units.[2]   The 237.4 grains of urinary nitrogen, therefore, would be equivalent to 1677.70 heat-units.

It is important, in following out the course of reasoning that I have attempted, to form an idea of the avenues of escape of the matter represented by the loss of body-weight during the twenty-four hours of abstinence from food.   There was no passage from the bowels, and the loss of weight, therefore, must have taken place by the urine, skin, and lungs. The total loss of weight was 56 ounces.   The water taken was 20 ounces, making 76 ounces.   I passed 34 ounces of urine of a specific gravity of $1023\frac{1}{2}$, the actual weight of which was 36 ounces.[3]   This leaves an actual loss of weight, deducting the weight of the urine, of 40 ounces.   This 40 ounces must have escaped by the lungs and skin in the form of carbonic acid and water.   No account was taken, in the experiment, of the actual amount of carbonic acid eliminated, and this I was forced to estimate.   It is stated by Dr. Edward Smith, as the result of observations upon four persons whose average weight was 160 pounds, that the total quantity of carbon eliminated in twenty-four hours was 7.144 ounces in a condition of perfect rest.[4]   This is equivalent to about 8.327[5] ounces for a weight of $186\frac{1}{2}$ pounds, which was the mean weight for the day.   Deducting the estimated carbon eliminated from 40 ounces, we have an elimination of a little less than 32 ounces of water by the pulmonary and cutaneous surfaces.   This is rather less than the estimates given in most works on physiology, but the difference is not very considerable.[6]   Returning to the elimination of car-

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[1] I calculate the nitrogen by estimating that the proportion of nitrogen in urea is 0.466, and that the proportion of nitrogen in uric acid is one-third.

[2] The Lancet, Dec. 16, 1876, p. 849.

[3] A. Flint, Jr., Chemical Examination of the Urine, New York, 1878, p. 70, table.

[4] Edward Smith, Experimental Inquiries into the Chemical and other Phenomena of Respiration.—Philosophical Transactions, London, 1859, p. 692.

[5] In calculating the loss of weight by the lungs and skin, it is proper to estimate the weight of the carbon eliminated instead of the weight of the carbonic acid, for the reason that the carbon comes from the body and the oxygen which unites with it to form carbonic acid comes, at least indirectly, from the air.   If we suppose that a certain quantity of the oxygen of the air unites with hydrogen to form water, which is thrown off, the weight of this oxygen should be deducted from the water ; but experiments are wanting to show the amount of oxygen which combines in this way, and such a correction could not be made with any degree of accuracy.

[6] Valentin estimates the average pulmonary exhalation at about 19 ounces (A. Flint, Jr., Physiology of Man, New York, 1875, vol. i., p. 447).   The estimate of the cutaneous transpiration is about 30 ounces (Ibid., vol. iii., p. 139).   Taking into account the sea-

bon, it is estimated that one ounce of dry fat contains 345.6 grains of carbon.[1]   An elimination, therefore, of 8.327 ounces of carbon would represent 10.541 ounces of dry fat.   According to Frankland,[2] the heat-value of 10.541 ounces of fat is equal to 10,759.09 heat-units.

From these calculations we have, for twenty-four hours of fasting, the following sources of heat, which are capable of being estimated:

	Heat-units.
Heat-value of 237.4 grains of urinary nitrogen . . .	1,677.70
Heat-value of 10.54 ounces of fat	10,759.09
Total	12,436.79

Estimating the heat produced by the body at four degrees per pound per hour, for a weight of $186\frac{1}{2}$ pounds—

	Heat-units.
We have produced in twenty-four hours	17,904.00
Deduct	12,436.79
Unaccounted for by urinary nitrogen and carbon excreted .	5,467.21

If we assume that the estimate of the heat-value of the urinary nitrogen be correct as well as the heat-value of the probable exhalation of carbonic acid, and if we assume that the estimated heat produced by the body be reasonably accurate, a little less than one-third of the heat produced during the twenty-four hours of fasting cannot be accounted for by the heat represented by the urinary nitrogen and the carbon eliminated.

This experiment, in which absolutely no food was taken, possesses many points of peculiar interest and advantage.   In such an experiment, we have but three matters discharged from the body, that demand serious consideration; viz., urinary nitrogen, carbonic acid, and water.   We can calculate the amount of nitrogenized matter of the body represented by the urinary nitrogen and estimate its heat-value.   We can also calculate the amount of fat represented by the carbonic acid discharged and estimate its heat-value.   The only thing that remains is the water.   From the estimates that have been made, there remain about 5500 heat units that cannot be accounted for by any heat-producing processes in the body represented by the amount of discharge of urea and carbonic acid.   I have estimated that about 32 ounces of water are lost during the day by the lungs and skin.   Of this 32 ounces, one-ninth, or 3.55 ounces, consists of hydrogen.   It is estimated that one kilogramme of hydrogen will produce 34,600 heat-units C.,[3] and one pound, the same number represented in pounds, or 62,280 heat-units Fahr.   The heat-value, then, of one ounce of hydrogen

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son of the year and the small amount of exercise and water taken, the estimate of 32 ounces for both the pulmonary and the cutaneous exhalation seems to be reasonable.

[1] Pavy, Food and Dietetics, Philadelphia, 1874, p. 440, quoted from Parkes.

[2] Letheby, On Food, New York, 1872, p. 94.

[3] Mayer, Celestial Dynamics.—Correlation and Conservation of Forces, New York, 1868, p. 261.

would be 3892.5 heat-units, or 13,818,375 heat-units for 3.55 ounces. If it could be shown that water is actually produced in the body by a union of hydrogen and oxygen, and that a sufficient quantity of oxygen is not returned to the air in the form of carbonic acid to combine with even one or two ounces of hydrogen, we could account, not only for the heat actually produced in the body, but for the heat assumed to be converted into force to carry on circulation, respiration, and any ordinary muscular work. There would be little difficulty in accepting such a theory of the source of heat and force produced, if it could be shown that the heat generated in the body exceeds the ordinary requirements; but when the number falls very far short, it seems impossible that the theory should be correct. The question here touched upon will be referred to farther on and discussed more fully.

Observation 3.—November 30, 1878, one week after the date of *Observation* 2, having entirely recovered from the effects of the previous experiment, I began the following observation, in which the quantity and the heat-value of food taken for twenty-four hours were carefully noted and calculated.

At 8 A.M., I had a passage from the bowels. The weight of the body taken just afterward, without clothing, was $186\frac{1}{4}$ pounds. The temperature under the tongue, taken for five minutes, was $98°$ Fahr.

At 8.45 A.M., I breakfasted as follows, taking each article from a separate plate, which was weighed before and after eating:

Lean beef-steak, 10 ounces, with bread, butter, and milk. The bread, butter, and milk were calculated for the twenty-four hours, and the bread-crum only was taken, without the crust.

At 1 P.M., I took a lunch of lean roast-beef, 6 ounces; boiled potatoes, 3.5 ounces, with bread-crum, butter, and milk.

At 5.30 P.M., the temperature under the tongue, taken for five minutes, was $99\frac{3}{4}°$ Fahr.

At 6.45 P.M., I dined on lean roast-beef, 10 ounces; fried potatoes, 3 ounces; Bass's ale, 24.5 ounces by weight, with bread-crum and butter.

At 12, midnight, the temperature under the tongue, taken for five minutes, was $100°$ Fahr. I retired and slept well during the night.

At 8 A.M., December 1, I had a passage from the bowels. The body-weight taken just afterward, without clothing, was $186\frac{1}{4}$ pounds, exactly what it was at the beginning of the experiment. The temperature under the tongue, taken for five minutes, was $98\frac{1}{4}°$ Fahr. During the twenty-four hours, I had taken 10 ounces of bread-crum, 3.75 ounces of butter, and 34.5 ounces of milk. The weather had been fine, with a temperature of $42\frac{7}{8}°$ Fahr., an average of eight observations. I had eaten of the articles indicated all that was possible. During the day, I walked about two miles, played at billiards for about three hours, and smoked five cigars. A calculation of the heat-value of the food was made by the following table reduced to ounces, from Letheby,[1] and carefully corrected from the original tables of Frankland:

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[1] Letheby, On Food, New York, 1872, p. 94.

Heat-units per Ounce Av. of the following Articles of Food oxidized in the Body.

Beef (lean)	160.12
Bread-crum	241.50
Potatoes	112.00
Butter	817.25
Milk	71.75
Bass's ale (alcohol reckoned)	87.06

According to this table, the following was the heat value of the food taken in the twenty-four hours :

	Heat-units.
Beef, 26 ounces	4,163.12
Bread-crum, 10 ounces	2,415.00
Potatoes, 6.5 ounces	728.00
Butter, 3.75 ounces	3,064.69
Milk, 34.5 ounces	2,475.37
Ale, 24.5 ounces	2,132.97
Total heat-value of food	14,979.15

Estimating the production of heat by the body as equal to four degrees per pound per hour—

	Heat-units.
We have produced in twenty-four hours	17,880.00
Heat-value of food	14,979.15
Unaccounted for by the heat-value of food . . .	2,900.85

This calculation leaves about one-sixth of the heat produced by the body unaccounted for by the heat-value of the food taken.

Possible Oxidation of Hydrogen in the Body, resulting in the Forma-tion of Water and the Production of Heat.—It is by no means a novel idea that oxygen may unite with hydrogen in the body to form water and produce heat ;[1] but thus far there has been no experimental demonstration of the actual production of water in the animal economy.   In the experi-ment in which I fasted for thirty three hours, for twenty-four hours of which no food was taken after the digestion of articles taken about nine hours before had been completed, I discharged about 32 ounces of water by the lungs and skin, and 34 ounces of water in the urine, making a total discharge of water of 66 ounces.   During this period, I drank 20 ounces of water, leaving 46 ounces over and above the quantity taken.   My loss of weight was 56 ounces, of which I estimate a loss of about ten ounces in solid matters in the urine and carbon by the lungs.   The question now is whether this loss of 46 ounces of water was simply a discharge of water already formed, from the blood and the watery parts of the tissues, or whether it is to be attributed in part to water actually formed in the body by a union of oxygen and hydrogen.   If the watery parts of the body be actually deficient in quantity, there is usually a sensation of thirst.   I did not suffer from thirst, and, indeed, I drank rather more water than I desired.

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[1] In 1780 and 1785, Lavoisier and Laplace advanced the view that animal heat was produced by the oxidation of carbon and hydrogen in the body.

Recent experiments by Valentin, Panum, Colin, and others, have shown, in opposition to the previously received opinions, that abstinence from food has very little effect in diminishing the volume of the blood.[1]   This fact, taken in connection with the absence of thirst during the twenty-four hours of fasting, is favourable to the view that all of the excess of water discharged did not come directly from the blood.

If water be actually produced in the economy by a union of oxygen and hydrogen, what is the probable source of these two elements?   There is no deficiency of hydrogen in the body, and, if it be used to form water which is discharged, there would be loss of weight when no food is taken, and it would be supplied by the food under ordinary conditions of nutrition. There is no deficiency of oxygen in the body itself, and the oxygen discharged in urea represents only about one-third of the proportion of oxygen contained in the nitrogenized constituents of the body.   Of the oxygen taken into the lungs, about 86 per cent. only is returned in combination with carbon to form carbonic acid, leaving 14 per cent. to form some other combination in the body, possibly a union with hydrogen.   There is, indeed, little or no difficulty in accounting for the elements to form water in the body, if it can be shown that more water is discharged from the organism than is taken with the ingesta, and that the excess thus discharged does not come simply from the watery parts, producing an actual deficiency of water in the body.[2]

The actual demonstration that more water is ever discharged from the body than can be accounted for by the water of the ingesta or by water simply withdrawn from the blood rendering this fluid more dense, presents very considerable but not insurmountable difficulties.   A process that would be open to few objections, provided all of the elements used in the calculations were accurate, is the one which I have attempted to employ in cases of loss of weight.   This process is the following :

Take the weight of a man at the beginning of the experiment, calculate accurately the weight of the ingesta for a certain period, and add this latter to the weight of the body.   This forms the sum total from which certain quantities are to be deducted.   Take then the weight of the urine and feces passed during the time of the experiment ; add to this the weight of the carbon contained in the carbonic acid exhaled, which carbon carries with it a portion of the inspired oxygen ; add both of these to the weight of the body taken at the close of the experiment ; the difference will give the amount of water discharged by the lungs and skin.   Having thus the quantity of water discharged by the lungs and skin, to ascertain the total

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[1] Robin, Leçons sur les humeurs, Paris, 1874, p. 50.

[2] Funke, Lehrbuch der Physiologie, Leipzig, 1876, Bd. i., S. 297.   I have quoted from Funke the results obtained by Pettenkofer and Voit, and have taken as an average of their results, 833 grammes of oxygen consumed and 985.2 grammes of carbonic acid produced in twenty-four hours.   985.2 grammes of carbonic acid represent 716.5 grammes of oxygen.

quantity of water discharged from the body, we have to add the water contained in the urine and feces. We then carefully estimate the amount of water contained in the ingesta and can compare the amount of water discharged with the quantity taken. In Pettenkofer's chamber, in which a man may be confined and all of the excreta be estimated, these calculations could be made with sufficient accuracy, and the only uncertain element in the problem would be as to whether or not the blood became modified in density or volume. In the following calculation, I was forced to estimate the amount of carbon eliminated ; but I endeavoured to correct this estimate by an indirect method, which will be described farther on. The subject of my experiment was the person mentioned in *Observation* 1, and the investigations described were continued for five days. The following is a summary of the results :

Observation upon the Ingress and Egress of Water.

		Ounces.
Body-weight at the beginning of the observation . .		1,907.20
Weight of the ingesta for five days		857.34
Total		2,764.54
Weight of the urine and feces for five days . .	220.47	
Carbon eliminated for five days, estimated at 10 ounces per day[1]	50.00	
Body-weight at the end of the five days (showing a loss of 55.2 ounces)	1,852.00	
	2,122.47	2,122.47
Water eliminated by the lungs and skin		642.07
Water contained in the urine and feces		208.89
Total water discharged		850.96

[1] As I have stated in the text, I was forced to estimate the amount of carbon discharged, but I preferred to put it too high rather than too low. Ten ounces per day is a very high estimate for a man weighing 115½ pounds. The following indirect calculation of the probable sources of carbon shows that this estimate is certainly sufficient. I calculate the total carbon of the food as amounting to about 25 ounces. To this I add the carbon of 48 ounces of muscular tissue consumed (5.28 ounces), and of 7.2 ounces of fat, both loss of weight (5.69 ounces). This gives about 36 ounces of carbon for five days. From this I deduct 9 ounces of carbon discharged in the urea, which leaves 27 ounces for five days, or 5.4 ounces per day. If I calculated that the entire loss of weight of 55.2 ounces should be estimated as fat—which is very improbable from the condition of the subject on beginning the walk, and the discharge of a considerable quantity of nitrogen from the body over and above the nitrogen of food—we should have about 59 ounces of carbon for five days, or 11.8 ounces per day. The last-named quantity would make very little difference in the results.

Water of the Food for Five Days.

Articles of Food.								Quantity. Ounces.	Quantity Water. Ounces.
Meat	.	.	.	.	.	.	.	23.87	16.95
Eggs	.	.	.	.	.	.	.	27.60	17.31
Milk	.	.	.	.	.	.	.	36.03	31.34
Bread	.	.	.	.	.	.	.	28.87	12.70
Beef-essence	.	.	.	.	.	.	.	42.13	40.03
Oatmeal gruel	.	.	.	.	.	.	.	18.09	17.19
Potatoes	.	.	.	.	.	.	.	5.00	4.38
Butter	.	.	.	.	.	.	.	4.88	0.73
Coffee	.	.	.	.	.	.	.	287.09	278.48
Tea	.	.	.	.	.	.	.	124.25	1 3.01
Water	.	.	.	.	.	.	.	11.75	11.75
Lemonade	.	.	.	.	.	.	.	227.16	227.16
Molasses and water	.	.	.	.	.	.	.	4.40	4.18
Tomatoes	.	.	.	.	.	.	.	3.12	2.97
Sugar, salt, pepper, bicarbonate of potash						.		12.10	
								857.34	788.18

Total water discharged in five days	.	.	.	.	.	850.96
Total water ingested in five days	.	.	.	.	.	788.18
Excess of water discharged in five days	.	.	.	.		62.78
Excess of water discharged per day	.	.	.	.		12.56

The heat-value of the hydrogen required to form one ounce of water is equal to 432.5 heat-units. The heat-value, then, represented by the formation of 12.56 ounces of water would be 5432.2 heat-units.

During these five days, the subject of this experiment walked $317\frac{1}{2}$ miles and lost 55.2 ounces in weight. As will be seen by reference to *Observation* 1, I have calculated the total heat produced by the body, the heat-units used in maintaining circulation and respiration and in walking $317\frac{1}{2}$ miles. I then calculated, also, the heat-value of the food and of the loss of body-weight, the latter estimated as muscular tissue, taking no account of the hydrogen. According to this calculation, there remained 38,926.52 heat-units unaccounted for. If we take in addition the heat-value represented by the excess of water discharged for the five days, which is equal to 27,161.00 heat-units, we have 11,765.52 heat-units unaccounted for, which is about sixteen per cent. of the heat-units expended, instead of fifty-five per cent. However, in estimating the heat-units used in respiration, circulation, and walking $317\frac{1}{2}$ miles, I have taken calculations that I regard as grossly erroneous; and I used them for sake of argument and without any confidence in their accuracy. The percentage of sixteen is probably not more than the error in the computation of the heat-units converted into force expended in maintaining circulation and respiration and in walking $317\frac{1}{2}$ miles.

One of the observations in which I calculated the amount of water discharged as compared with the quantity ingested was for twenty-four hours of abstinence from food. (See *Observation* 2.) The other was for a person who lost considerable weight as the result of excessive muscular

exertion.   Even when no food is taken, a certain amount of heat must be produced, and the standard animal temperature must be maintained. The heat thus produced cannot be accounted for by the carbon discharged in carbonic acid, but it can be accounted for by the hydrogen discharged in water, and it seems reasonably certain that water is actually formed in the body.   Under excessive exercise attended with loss of weight, it seems certain that water is produced in the body by a union of hydrogen and oxygen.   Animal heat is undoubtedly produced very largely by oxidation; and it has been shown that muscular work, while it has a tendency to raise the animal temperature, very considerably increases the elimination of water.[1]   The chemical products of this oxidation are represented mainly by urea, as far as nitrogen is concerned, by carbonic acid, and by water.   There are thus three elements with which the oxygen combines; viz., nitrogen, carbon, and hydrogen.   We cannot account for the total amount of heat produced in the body by the urea and carbonic acid discharged, but this can be accounted for by supposing that a certain quantity of hydrogen is oxidized in the body to form water.

I do not pretend to assert that the oxygen absorbed by the blood in its passage through the lungs forms a direct and immediate union with carbon and hydrogen to form carbonic acid and water.   If such a union take place, carbonic acid and water are the final products resulting from a series of molecular changes, the various steps of which we are unable to follow; but it is probably true that, if a union of oxygen with carbon and hydrogen will produce a definite amount of heat, the quantity of heat is the same whether the combination be slow or rapid.   As regards the oxidation of carbon and hydrogen, all that it is necessary to show is that carbonic acid and water are actually produced in the body, as a part of the final results of the intricate molecular changes involved in nutrition and disassimilation.   There is no good reason to suppose that the processes of physiological wear or disassimilation of the tissues are radically changed in their character during a short period of abstinence from food, or during exercise which for a time wastes the tissues more rapidly than they can be repaired.   When the appropriation of nutritive matters produces an equilibrium between the physiological waste and repair, it is logical to conclude that the waste of the tissues, which involves the oxidation of a certain quantity of carbon, nitrogen, and possibly hydrogen, is repaired by the food, the nature of the processes involved in the waste being the same as during a period of abstinence from food.   As regards, therefore, the oxidation of hydrogen, we may suppose that the hydrogen of the non-

[1] Pettenkofer and Voit, as one of the conclusions arrived at by experiments upon a man 28 years of age, kept for twenty-four hours in their large respiration-apparatus, make the following statement: "The elimination of water is very much increased by work, and the increase continues during the ensuing hours of sleep." (Journal of Anatomy and Physiology, Cambridge and London, 1868, vol. ii. p. 181.)

nitrogenized parts is consumed, and that the matter thus consumed is supplied again to the tissues in order to maintain the physiological status of the organism.

The supposition that water may be actually formed within the organism under certain conditions not only completes the oxidation-theory of the production of animal heat, but it enables us to understand certain physiological phenomena that have heretofore been obscure. It is well known, for example, that a proper system of physical training will reduce the fat of the body to a minimum consistent with health and strength. This involves a diet containing a relatively small proportion of fat and liquids, and regular muscular exercise attended with profuse sweating. We have seen that muscular work increases the elimination of water, while it also exaggerates for the time the calorific processes. The muscular exercise undoubtedly favours the consumption of the non-nitrogenized parts of the body, and a diminution of the supply of hydrocarbons, carbohydrates, and water in the food prevents, to a certain extent, the new formation of fat. By taking an excessive quantity of liquids, we do not increase the calorific processes or promote activity of the circulation, and the excess of water is usually discharged by the kidneys. When, however, we exert the muscular system excessively, we increase the production of water and the circulation becomes more active. The volume of blood then circulating in the skin and passing through the lungs, in a given time, is relatively increased, and there is an increased discharge of water from these surfaces. The same condition that produces an increased quantity of water in the body and has a tendency to exaggerate the process of calorification seems to produce also an increased evaporation from the surface, which serves to equalize the animal temperature. It is stated by Mr. Maclaren, the author of an excellent work on training, that in one hour's energetic fencing, the loss by perspiration and respiration, taking the average of six consecutive days, was about three pounds, or, accurately, forty ounces, with a varying range of eight ounces.[1]

Conclusions.—I shall restrict the conclusions to be drawn from the experiments that I have described to points connected with the production of animal heat. It is undoubtedly true that, computing all of the force produced in the body as heat-units, more heat is generated than is absolutely necessary to maintain the normal animal temperature, and that a certain amount of this excess is manifested as force used in the work of respiration and circulation and general muscular effort. The computation of the force thus used is always made in accordance with the formula that one heat-unit is equivalent to 772 foot-pounds. The reduction of the force of the heart and the force exerted by the respiratory muscles to units of foot-pounds is so excessively difficult and uncertain that the

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[1] Maclaren, Training, in Theory and Practice, London, 1866, p. 89.

estimates given by writers are, in my opinion, almost worthless. The same remark applies to the reduction of ordinary muscular work to definite units. Without some such reduction, the force exerted by muscles cannot be expressed in definite quantities. All that we can do is to show, if possible, that more heat-units are produced in the body than are required to maintain the heat of the body, and that a part of the excess is converted into force. I do not conceive that the simple experiment, which shows that one pound in falling 772 feet will produce heat enough to raise the temperature of one pound of water one degree Fahrenheit, proves absolutely that one heat-unit produced by burning food in oxygen, when the same food is oxidized in the body, making allowance for that which escapes such oxidation, can be converted into a muscular force equal to 772 foot-pounds.

The experiments which I performed were made under serious disadvantages. While it was not difficult to collect the urine and feces and to estimate the constitution of the food, I had no apparatus which would have enabled me to ascertain exactly the amount of oxygen absorbed and of carbonic acid exhaled for a number of hours. With such an apparatus as Pettenkofer's respiration-chamber, it would be possible to make an actual measurement of the quantity of oxygen absorbed and of carbonic acid and water excreted, and thus it might be shown whether or not water can be produced in the body ; and, if it could be demonstrated that water can be thus produced, it could be ascertained what proportion of such water was probably produced by a union of a portion of the inspired oxygen with hydrogen, by simply deducting the oxygen used in the formation of carbonic acid from the total quantity consumed. Still, taking my experiments as they are, and connecting them with what had been previously ascertained with regard to the questions under consideration, I think I am justified in drawing from them the following conclusions :

1. It is probable, and, indeed, almost certain, that nearly all the animal heat is produced by oxidation, in the body, of certain elements, which are chiefly nitrogen, carbon, and hydrogen.

2. It is probable that this oxidation does not take place entirely in the blood, but that its seat is in the substance of the various tissues, and that it is connected with the general processes of nutrition and disassimilation. Heat is thus evolved, and the final products of the chemical actions involved are mainly urea, carbonic acid, and water. It must be remembered, however, that the oxidation is not necessarily a process identical with combustion out of the body, but that it is probably connected with a series of intricate molecular changes, which cease with the life of the tissues, and of which we are able to recognize only the final results ; viz., calorification and certain chemical products.

3. Recognizing the products, urea, carbonic acid, and water, as representing probably the evolution of a certain amount of heat, we cannot

account for the heat actually produced in the body by the amount represented by the urea and carbonic acid discharged. If we admit that hydrogen is oxidized in the body, resulting in the evolution of heat and the production of water, this will enable us to account for all the heat actually manifested as heat, leaving an excess which may be converted into force.

4. My experiments show pretty clearly that, when no food is taken and when, food being taken, muscular work is performed, so that there is loss of body-weight, water is actually produced in the body. This, and this only, enables us to account for all the heat evolved under these conditions. There is no reason to suppose that the processes involved in the production of heat are radically changed in their character when enough food and water are taken to maintain a uniform body-weight.

5. Animal heat is produced mainly by oxidation of the nitrogen, carbon, and hydrogen of the tissues, the waste of these elements being supplied by the food. Probably the oxidation of carbon and hydrogen is a more important factor in calorification than the oxidation of nitrogen; at least it is certain that the heat-value of the oxidation of carbon and hydrogen is greater than that of the oxidation of nitrogen, and the quantity of heat thus produced is very much greater. Of the two elements, carbon and hydrogen, the oxidation of which produces animal heat, the heat-value of the hydrogen is by far the greater.

6. It is probable that there is always a certain amount of oxidation of hydrogen in the body, and that this is necessary to maintain the animal temperature; and it is almost certain that this occurs during prolonged abstinence from food and when the production of heat is much increased by violent and protracted muscular exertion. It may be, also, that there is an active and unusual oxidation of hydrogen as well as of carbon in fevers.

Alcohol, which is so extensively used as a measure of sustaining treatment in fevers, is now almost universally recognized as an element consumed in the body and not discharged to any considerable extent as alcohol. According to Brande,[1] Cognac brandy contains 46 per cent. of absolute alcohol. With a specific gravity of 0.930, one ounce of brandy weighs 406.875 grains and contains 187.1625 grains of alcohol. The alcohol, with a composition of $C_4H_6O_2$, contains 12.9 per cent. of hydrogen, or 24.14 grains, and 52.65 per cent. of carbon, or 98.54 grains. The heat-value of 24.14 grains of hydrogen equals 214.77 heat-units. The heat-value of 98.54 grains of carbon equals 182.44 heat-units.[2] Taking, then, the total heat-value of the hydrogen and carbon contained in one ounce of brandy, and taking no account of the oxygen contained, the heat-value amounts to 397.21 heat-units. If we assume that a man produces

[1] Brande and Taylor, Chemistry, Philadelphia, 1867, p. 583.
[2] Mayer, Celestial Dynamics.—Correlation and Conservation of Forces, New York, 1868, p. 261.

four heat-units per pound weight of the body per hour, the amount of heat normally produced in twenty-four hours by a man weighing 140 pounds is equal to 13,440 heat-units. The quantity of brandy required to supply this amount of heat, according to the calculations I have just made, would be a little less than 34 ounces. Theoretically, then, it is easy to see how alcohol may furnish material to supply heat and save waste of tissue in fevers. It is not very unusual, in certain stages of fever, to administer from 16 to 32 ounces of brandy in twenty-four hours.

I conclude this essay with the following query, which has occurred to my mind in connection with my reflections upon the question of the oxidation of hydrogen as one of the sources of animal heat:

If the excessive heat produced in essential fevers be due in part to an excessive oxidation of hydrogen, why would not the exhaustion and rapid emaciation which attend the progress of fever be more or less moderated by supplying hydrogen to the system in the form of fatty matters, starchy matters, sugar and alcohol, until the fever has run its course; and might not this supply, to a certain extent, the abnormal waste of tissue?

Article III.

CONTRIBUTIONS TO THE PATHOLOGY OF PERIPHERAL NERVE-DISEASES. By JULIUS ALTHAUS, M.D., M.R.C.P., Senior Physician to the Hospital for Epilepsy and Paralysis, Regent's Park, London.

INFLAMMATION of the nerves is by some pathologists considered to be an extremely rare, and by other a more common affection. Dr. Weir Mitchell, an American physician to whom we owe an able monograph on injuries of nerves and their consequences, of which he saw numerous examples during the American civil war, considers acute idopathic neuritis an uncommonly rare disease; while Benedict, Remak, and others, appear to have enjoyed almost daily opportunities of meeting with such cases. My own experience leads me to believe that instances of this description are certainly more common than is generally supposed, and that although the evidence of post-mortem examinations is as yet not large, nevertheless the clinical symptoms are in many cases sufficiently striking to warrant the diagnosis of neuritis or perineuritis. One special affection of this class has recently been very closely investigated—I allude to optic neuritis, in which the changes going on in the nerve may be closely followed by the aid of the ophthalmoscope; and the observations made on this disease by Von Graefe in Germany, and Drs. Jackson, Clifford Allbutt, and others in this country, have thrown considerable light on its

pathological relations. It is my purpose in the present communication to draw attention to the occurrence of inflammation in some other cranial nerves, where it has not yet received the amount of consideration which the interest of the subject seems to warrant. Indeed I have not been able to discover in medical literature any records of acute olfactory and auditory neuritis, of which I will relate instances which have fallen under my observation; while with regard to inflammation of another nerve—the portio dura of the seventh pair—indeed a considerable amount of information has been obtained, yet many of the clinical features of the affection are not as yet well known, although they are of great importance in their relation to diagnosis, prognosis, and treatment.

Inflammation may attack the entire structure of the nerve or only its investing membrane, the perineurium, which consists of connective tissue with small bloodvessels and nerves. According to this we speak of neuritis or perineuritis. The fundamental difference between the two diseases appears to me to be, that in neuritis the central core or cylinder axis undergoes the same degeneration as all the other portions of the nerve, while in perineuritis this important structure escapes destruction.

In acute neuritis there is at first hyperæmia, more particularly in the smallest veins and capillary vessels, and less in the arterioles. The nerve appears to the naked eye uniformly congested and livid, or dilated bloodvessels may be distinguished, more particularly in certain portions of the same, as, for instance, where it traverses an osseous canal, the walls of which are unyielding, and therefore add to the intensity of the inflammatory symptoms. The nerve is swollen, moist and turbid, and the smaller bundles of nerve-fibres are surrounded by a serous or fibrinous effusion which has a gray or reddish jelly-like appearance, and often contains hemorrhagic spots of variable size. If the nerve be examined microscopically, it is found that crowds of white blood-corpuscles have migrated into the sheaths of Schwann, and the septa of connective tissue, which divide the nerve into its smaller funiculi. The myeline or medullary substance of Schwann appears divided into segments; softening and suppuration set in, and the structural elements of the nerve, including the cylinder axis, become disorganized, and disappear. Ultimately there is cicatricial shrinking, proliferation of connective tissue, and formation of oil-globules and amyloid bodies; that is, sclerosis and atrophy. The nerve is then changed into a cord of connective tissue, which is intimately connected with the neighbouring parts.

The inflammatory stage of acute neuritis lasts, according to my observations, from four to six weeks.

Neuritis may also be chronic, when there is less tendency to suppuration and softening, and more primary sclerosis. Proliferation of the connective tissue is then the most prominent symptom, and Virchow has therefore called this form *interstitial proliferating neuritis*. The nerve appears

thickened and hardened, it has lost its brilliancy and is more cloudy, and there is only moderate hyperæmia. Wasting of the nerve-structures is then much slower, and caused more by pressure than by active inflammation. Again, there are cases where not only the connective tissue, but also the nerve-structure becomes hypertrophied. This process is designated as *hyperplastic parenchymatous neuritis*, and may lead to the formation of neuroma. Where the inflammation is not uniform, but more disseminated, affecting some parts and sparing others, the nerve assumes a spindle-like or nodulated appearance, and we then speak of *neuritis nodosa*. Sometimes there is a tendency for the inflammation to spread to a considerable distance beyond the point originally affected, both upwards and downwards; this is called *ascending* and *descending neuritis*. The former of these may ultimately reach a nervous centre, and then give rise to symptoms of much greater gravity than are ever caused by peripheral neuritis.

Where the inflammation is not severe, it does not always proceed to destruction of the contents of the nerve-tubes, or at least only to partial destruction. Regeneration of destroyed nerve-fibres may then take place, and is generally protracted for three months or even longer. This regeneration seems more easily effected in nerves which have only the function of common sensation and motion, and less easily in those which belong to the special senses. Thus I have seen it occur where the fifth nerve was affected even in a severe degree, and it is common in inflammation of the portio dura; while when the olfactory, auditory, or optic nerve have suffered in this manner, there is very much less chance of regeneration. Perineuritis is, of course, other things being equal, much less grave than neuritis, as the inflammation is in this disease more confined to the sheaths of the nerves, and does not implicate the cylinder axis.

The causes of neuritis may be local or general. All the various kinds of injury may give rise to it; cold is likewise a fruitful source. Certain systemic affections, such as diphtheria, smallpox, typhoid fever, pneumonia, rheumatic fever, lead to it. Syphilis causes neuritis, not so much primarily as by spreading of inflammation from neighbouring structures, more particularly the periosteum and bones, the membranes of the brain and spinal cord, etc. In the same way non-syphilitic inflammation or irritation of contiguous parts may give rise to neuritis. In lepra anæsthetica there are evidences of chronic perineuritis; and progressive locomotor ataxy is very frequently ushered in by neuritis of one or several of the cranial nerves.

I. *Olfactory Neuritis.*—The first case I wish to relate is one of acute idiopathic neuritis of the olfactory nerves, which occurred in a patient who is now under my care at the hospital, suffering from progressive locomotor ataxy.

C. S., a banker's clerk, aged 48, married and father of two children, had been in tolerably good health until about eight years ago, when, appa-

rently without any particular cause, he suddenly began to feel numbness in his feet, and lost the proper perception of the hardness of the ground. It seemed to him as if he was treading on India-rubber balls, or bales of cotton. About the same time he was startled by perceiving a strong smell of phosphorus, which overpowered all other accidental smells, and never left him at all for about six weeks. At the end of that period he noticed that he had entirely lost the sense of smell for odoriferous substances of any description. The smell of phosphorus had then given way to a persistent and not unpleasant kind of scent sensation, which he compared to that of civet very much softened down. This sensation continued for several years, but is now likewise gone; and there is at present a total absence of any olfactory sensibility. I tested the patient with assafœtida, ether, valerian, camphor, millefleurs, opoponax, and a variety of other strongly-smelling substances, either pleasant or disagreeable, none of which, however, caused the slightest effect upon his nose. He did perceive ammonia, which caused lachrymation and a choking sensation, just as in healthy persons, and also the vapors of strong acetic acid, and snuff, which caused sneezing. All these last-named substances, however, act on the nerves of common sensation, *i. e.*, the nasal twigs of the ophthalmic branch of the fifth nerve, and of the spheno-palatine ganglion.

The perception of flavours in eating and drinking was likewise almost entirely gone. It is a well-known fact that the gustatory nerve only responds to four different kinds of sapid substances, viz., the saline, the acid, the bitter, and the sweet; and that flavours are recognized by the olfactory, not by the gustatory nerve. In accordance with this, I found that, when the patient's eyes were bandaged, so that he could not see what he was eating or drinking, he was unable to distinguish between stewed onions, apples, and turnips; although he could tell roast beef from roast mutton. He did not perceive the flavour of port wine or claret, but felt the former hotter than the latter, saying it was gin or brandy, while claret appeared to him like water. These sensations were evidently owing to impressions made on the lingual and palatine branches of the fifth nerve, and partook of common sensation rather than of special sense. It is a singular fact that, until experimented upon in this manner, the patient was not aware that he had lost the perception of flavours, but thought that he tasted everything quite as well as previous to having lost his smell; vision and memory evidently supplying, in this instance, the lost sense.

It is not necessary for my present purpose to enter into further details of this case. Suffice it to say that all the usual symptoms of ataxy, with regard to motion, sensation, and reflex action in the upper and lower extremities, as well as the condition of the bladder, rectum, and sexual organs, were present, and that the patient offers one of the most perfect types of sclerosis of the posterior columns of the spinal cord that can well be imagined.

Remarks.—In considering the pathology of this singular and instructive case, several questions force themselves on our notice: 1st. Was the loss of smell owing to an affection of the nerve, or of the accessory mechanism of smell? Anosmia, or loss of smell, may arise from either of the two. Thus we find it coming on through acute or chronic inflammation and thickening of the mucous membrane of the nose, more particularly from ozæna of syphilitic or strumous origin, from polypus, from adhesion of the soft palate to the posterior wall of the pharynx, which prevents the air

from passing through the upper or olfactory channel of the nose, etc.
Again, we find smell impaired in facial paralysis from lesions of the portio
dura, owing to loss of power in the compressor and dilator naris muscles.
Both these muscles are of importance to olfaction, each serving for a par-
ticular mode of smelling at a substance.   When we smell by taking a long
forcible inspiration through the nose, while keeping the mouth closed, the
nostrils become dilated in order to admit as much of the air charged with
odoriferous substances as possible.   In facial palsy this active dilatation of
the nostril is impossible on the side of the lesion, so that smell will be im-
paired.   In sniffing, which is really more effectual than one long inspira-
tion, the compressor naris muscle comes into play.   The air is then drawn
in by a rapid succession of short and shallow efforts, during which the
nostrils contract ; the object of this being to close the lower respiratory
channel and to allow all the air to pass through the upper olfactory channel.
Lateral compression of the nose, however, is impossible where the com-
pressor naris is paralyzed, so that the patient affected with facial palsy
cannot sniff.   A final reason why smell suffers in that disease is that the
tensor tarsi, or Horner's muscle, is paralyzed.   This small muscle, which
is really a portion of the orbicularis oculi, draws the openings of the lach-
rymal ducts backwards, so that they may absorb the tears ; and where it
is put out of action, the tears are apt to run down the cheek instead of
entering the nasal cavity, thus rendering the latter unnaturally dry, and
therefore not well suited for the perception of smells.   In all such cases
smell may be impaired or lost, and yet the olfactory nerves and their centre
in the brain be quite healthy ; but in the present case the whole accessory
mechanism of smell was in perfect order.   The conclusion is therefore
inevitable that the nervous arrangement had suffered at some point of its
course between the nose and the brain.

The second question, therefore, which we have to consider, is whether
the nerve-affection, which led to the loss of smell in the present instance,
was a peripheral or a central one ?   Was it owing to some disease of the
first pair of cranial nerves, or of the olfactory centre in the brain ?

The centre of smell in the brain is believed to be situated near the
island of Reil and the fissure of Sylvius, and in close proximity to the
third left frontal or Broca's convolution, which is known to be the seat of
intelligent language.   Thus we find anosmia occasionally associated with
aphasia and right hemiplegia, from softening of, or hemorrhage into, these
structures.   In such cases, however, the loss of smell is unilateral, and
confined to the side of the lesion, which, in aphasia, is always the left
side of the brain.   We have therefore right hemiplegia and left anosmia.
This apparent discrepancy is satisfactorily accounted for by the circum-
stance that there is no decussation of the olfactory paths in the anterior
commissure which joins the two temporo-sphenoidal lobes of the brain,
and smell, therefore, is appreciated on the same side on which it is per-

ceived.   Experimental physiology has gone a step further in localizing the seat of the centre of smell even more exactly.   Dr. Ferrier[1] finds this centre to be situated in the tip of the temporo-sphenoidal lobe or the subiculum cornu ammonis, which appears likewise to contain the centre for the perception of taste.   Faradization of this part in monkeys, cats, dogs, and rabbits is followed by a peculiar torsion of the lips, and partial closure of the nostrils on the same side, i. e., a sniff.   Similar signs are produced by the direct application to the nostrils of powerful or disagreeable odours; and they are unquestionably the outward expressions of the excitation of subjective olfactory sensation of an intense character.   Again, while stimulation of the subiculum causes olfactory perceptions, destruction of this part appears to cause loss of smell.   Thus, for instance, it was destroyed in the left side of the brain, and a piece of apple was then offered to the animal, which took it, smelt it, and began to eat.   The right nostril was then securely plugged with cotton-wool, and a piece of apple was once more offered.   The animal again took it, but hesitated before eating, raised it repeatedly to the nostril and endeavoured to smell it, but apparently without success.   An additional fact tending to show that the subiculum is the centre of smell is, that its structure is particularly developed in animals endowed with a very keen sense of smell, such as the dog, cat, and rabbit; and in them the anatomical connection of the olfactory tract with the subiculum is evident to the naked eye.   In the monkey and man, where smell is not so keen, this connection is not so patent, yet thoroughly established by microscopical investigations.

Was therefore disease of the subiculum the cause of the anosmia in the present instance?   To this I feel compelled to give a negative reply.   We have seen that there is no decussation of olfactory paths in the anterior commissure, and that in central softening or hemorrhage the loss of smell is confined to one side.   In the present case, however, the affection was bilateral; and moreover the sense of taste was perfectly normal.   Surely, if there had been a lesion extensive enough to destroy both subicula, other symptoms, and more particularly loss of taste, would have been present. In their absence it seems to me permitted to assume that the lesion was a peripheral one, and occurred most probably where the olfactory bulbs lie closely together at the base of the brain, on the cribriform plate of the ethmoid bone.

The third point which I wish to discuss in connection with this case is the pathological nature of the affection.   In considering this we cannot derive any assistance from post-mortem records of such or similar cases. It is true that sclerosis and atrophy of cranial nerves have been discovered in cases of ataxy which have proved fatal at an advanced stage of the complaint, but this does not give us any clue to the question whether the original lesion was inflammatory or one of simple disintegration, since both lead

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[1] The Functions of the Brain, London, 1876, p. 183.

to sclerosis. Nor are the indications given by the ophthalmoscope in the amblyopia and amaurosis of ataxy altogether decisive, as it is not yet decided whether the lesion of the optic nerve in these cases is one of simple atrophy or of neuritis, which has led to atrophy. We are, therefore, obliged to look to the clinical symptoms of the case as our guide in this matter. There was at first a stage of sensory hyperæsthesia, which, after having lasted for six weeks, merged into complete anæsthesia of both olfactory nerves. This corresponds closely to what I have observed in neuritis of the fifth nerve, where there is likewise a stage of hyperæsthesia as evidenced by severe pain in the parts supplied by that nerve, and lasting for five or six weeks, after which complete anæsthesia and motor paralysis of the muscles supplied by the small root of the nerve has set in.

What is the meaning of the singular symptom of the patient perceiving the smell of phosphorus during the whole first period of the disease ?   I believe I am in a position to affirm that the olfactory nerve responds to stimulation other than by special odoriferous substances, by perception of the smell of phosphorus. It is well known that the constant voltaic current has a peculiar action on the nerves of special sense, which answer to its passage by certain well-marked sensations. Thus, galvanization of the optic nerve causes flashes of light, of the gustatory nerve a coppery taste in the mouth, of the auditory nerve a ringing or hissing noise in the ear. It is easy to demonstrate these facts, because the nerves I have just mentioned are very sensitive to the influence of the voltaic current, and therefore respond to a moderate power ; while the olfactory will only give an answer when a very high power is used. A powerful voltaic current, however, when applied to the nose or any other part of the face, causes such disagreeable sensations of pain, giddiness, sickness, fainting, together with dazzling flashes of light and loud noises in the head, that experimenters in general have been unwilling to bear the inconvenience of the procedure or unable to analyze all the various sensations perceived at the time. The fact, therefore that the olfactory nerve does respond to the voltaic current by the perception of a phosphorous smell was not established until some years ago, when I demonstrated it in a patient who suffered from bilateral anæsthesia of the fifth pair of cerebral nerves. In this case a high voltaic power could be borne without inconvenience, because the patient was insensible to a moderate power. This patient was in perfect health except as far as the affection of the fifth nerve was concerned. His smell was keen ; and, when the current was directed to the mucous membrane of the nose, which was insensible to ordinary stimulation, the patient invariably, and without having been questioned about it, said : " I smell phosphorus ;" just as he mentioned that he saw flashes of light when the current was directed to the eyes. It is fair to assume that irritation of the olfactory nerve by hyperæmia and inflammation will cause a smell of phosphorus, just such as I have shown to follow voltaic irritation of the nerve, and just as in

retinitis flashes of light are perceived by the patient. All these circumstances taken together appear to me to warrant the conclusion at which I have arrived, that the case just related was one of acute olfactory neuritis, ushered in by hyperæsthesia, and marked in its later stage by anæsthesia of this special sense.

II. *Auditory Neuritis.*—The series of symptoms generally known as Menière's disease, appears to me to be owing to a considerable variety of anatomical lesions, and the term which has been given it in order to mark the merit of the illustrious French aurist who first drew attention to this class of cases, is therefore somewhat of a misnomer, as it does not designate a pathological entity. It is true that we possess at present only a few and meagre post-mortem records of such cases ; yet the clinical symptoms are sufficiently striking to enable us to decide that they cannot all be owing to one and the same morbid process, and that the only connecting link between them is that their seat is in the membranous labyrinth. I think it would be best to confine the term " Menière's disease" to apoplexy of, or, more properly speaking, hemorrhage into, the labyrinth, as most of the cases described by Menière belonged to that class, and the only case in which he obtained an autopsy was also one of them. This was the case of a young woman who took cold at the period of menstruation, while riding on the top of an omnibus, and was suddenly seized with deafness, persistent vertigo, and vomiting. She died on the fifth day, and it was found that the centres of the nervous system were perfectly healthy, but that the semicircular canals on both sides were filled with a clot of blood, replacing the endolymph. This clot extended in a minor degree into the vestibule, but did not spread as far as the cochlea. Similar cases, but in which the cause was injury to the bone, causing hemorrhage and subsequent inflammation, have been recorded by Politzer and Voltolini. In one of them the injury was a blow on the temple, in the other a fall on the back of the head. In other cases the symptoms have come on without any apparent cause, and it is not improbable that in these the hemorrhage may have been owing to rupture of miliary aneurisms of the labyrinthine arterioles, and therefore be analogous to the ordinary form of cerebral hemorrhage. Such hemorrhage, however produced, causes an increase of the intra-auricular pressure, which is quite sufficient to account for such symptoms as deafness, tinnitus, unsteady posture, so that the patients are unable to stand or walk firmly, and fall down or are only prevented from falling by the bystanders ; together with fainting, nausea, and in some cases insensibility.

There are, however, unquestionably, other pathological processes giving rise to similar symptoms as those just described. One of them I believe to be simple hyperæmia of the labyrinthine vessels, which I suspect in cases where the symptoms are sudden in their onset, not very severe, and transitory in their appearance. Sometimes the attack is entirely over in

a quarter of an hour, without leaving any traces; and in such cases it is impossible to assume the existence of hemorrhage. Another and more important lesion I believe to be inflammation, which may be idiopathic, *i. e.*, occurring without any apparent cause, or symptomatic, *i. e.*, coming on in the course of severe systemic affections, more particularly pyæmia, the eruptive fevers, erysipelas, typhoid and puerperal fever, constitutional syphilis, etc. Again inflammation may spread contiguously to the laby-rinth from other parts, such as the middle ear, when this is affected by acute catarrh and purulent inflammation; and the membranes of the brain, in sporadic or epidemic cerebro-spinal meningitis. It is also worthy of notice that somewhat sudden deafness occurs in connection with infantile eclamp-sia; and it appears highly probable that in such cases the real cause of the convulsive seizures as well as of the deafness, is irritation or inflam-mation of the labyrinth, and that the fits are caused by the extreme liability of infants to convulsive attacks from whatever cause, whether central or eccentric. Inflammation of the labyrinthine expansion of the auditory nerve I believe to be more common than is generally thought, and it has no doubt often been confounded with congestion or inflamma-tion of the brain, and even been put down as an attack of severe dyspep-sia and congestion of the liver. The chief distinction in the clinical symptoms of hemorrhage and inflammation is that the symptoms are not so severe and sudden in their onset in the latter, that they continue for a more considerable time, and become gradually more developed.

I will now relate the details of a case of what I believe to have been neuritis of the labyrinthine expansion of the auditory nerve, which oc-curred in a patient who was admitted into the hospital under my care, in January, 1876, suffering from progressive locomotor ataxy.

H. W., aged 32, married, father of three children, and a butcher by trade; had been in good health until the commencement of 1875, when he began to feel poorly, and suffered from a troublesome form of indiges-tion, with nausea and loss of appetite. In May of the same year he sud-denly began to squint and see things double, evidently from paralysis of one of the ocular muscles, although it would be impossible to determine at present which one of them was affected. These latter symptoms lasted only for a few days, and then left him; but shortly afterwards he was affected with vertigo and a roaring noise in the head. There was also a feeling of sickness, but no vomiting. Within a few days the tinnitus increased considerably, and appeared to him like thunder, or as if there were explosions of gunpowder in his head; at other times it resembled ringing of bells and screaming of whistles. There was at no time any loss of consciousness. This severe form of tinnitus lasted for rather more than a month, during which time the hearing of the patient, which before then had been perfectly good, was *gradually* much diminished, and at the end of the period mentioned, he found himself completely deaf. By this time the vertigo had left him, but on going about he noticed that he did not walk as well as before, more particularly in the dark, and was apt to stumble, especially on turning round; and he felt the peculiar sensation

as if walking on cotton or bladders. Pain of a character peculiar to ataxy began to shoot through the lower extremities, more especially in the night, and on exposure to wet or cold. The ataxy increased rapidly, in spite of medical treatment, so that he became completely helpless; and when he entered the hospital, in January, 1876, he had already reached the third stage of the disease, in which not only the co-ordination of movements, but also muscular power suffers.

The examination of the patient proved unusually troublesome, as he was stone-deaf, and all questions had therefore to be written down for him on a slate, which he always carried about with himself. He was found to be utterly insensible to the shrillest and loudest noise, such as that of a cab-whistle blown just behind him; as well as to the sounds of musical instruments. He could not hear a watch tick when it was applied to the external ears or the cranial bones around; nor did he perceive the sound of a tuning fork applied to the vertex, and to the teeth. On applying the constant voltaic current to the ears, a distinct sound was perceived on making with the cathode and breaking with the anode. This sound the patient likened to a " blowing" or " ringing" noise, and it appeared to continue for some seconds after the current had commenced and ceased to act. This was over and above the habitual tinnitus, which never left the patient, and which was now of a moderate kind, resembling the flowing of water. The patient spoke intelligibly, and although he could not hear himself speak, he had no deficient or altered intonation of the voice.

The physiognomical expression was peculiar. His features appeared in perfect repose and unimpressionable, except when a question in writing was put to him. Having noticed a similarly statuesque expression in anæsthesia of the fifth nerve, from loss of cutaneous and muscular sensibility, I carefully tested the sensibility all over the face, but found it perfectly normal; and the total absence of physiognomical expression was therefore in this case owing to the patient being as it were shut out from the world, and his being indifferent to what went on around him.

I will here remark at once, that some time later, I had the advantage of Mr. Dalby's opinion on the state of the patient's ears. He confirmed my diagnosis of the nervous origin of the deafness. He found the external and middle ear, including the Eustachian tube and the tympanum, perfectly healthy. The conduction of sound was good, but the perception of it faulty; and he therefore thought the deafness due to change in the nervous structures, either in the labyrinth or intra-cranial.

The patient had not inherited any tendency to nervous affections, such as paralysis, insanity, or neuralgia. He had always been a steady, hardworking man, not given to alcoholic or venereal excess. He had never had syphilis or gonorrhœa. He never smoked. He had however in his trade, as a butcher, been obliged to go about a great deal in all kinds of weather, and in the small hours of the morning; and had lately had much anxiety about money matters.

There were no symptoms indicating cerebral disease; the intellect, memory, and speech being quite normal; and all the cerebral nerves, with only the exception of the auditory, were in full functional activity.

The spine was not tender to pressure or percussion, nor was there any spontaneous pain in it; and the pain in the limbs was less marked than it had been some time ago. There was incomplete cutaneous anæsthesia from the waist downwards to the feet, and also incomplete muscular anæsthesia. Tickling the soles produced no reflex movements, and pinching

the gastrocnemius and rectus femoris produced hardly any sensation. The muscles were flabby and somewhat wasted, but responded freely to the voltaic and faradic currents. The patient could not walk at all, except when supported by two persons, and even then he had the greatest difficulty in stepping out, the peculiar jerking gait of ataxy being plainly discernible. The helplessness was so great that it verged on paralysis. He could only stand when supported by two sticks, and when he closed his eyes he reeled like a drunken man. Yet he could when lying down or sitting on a chair move his legs and feet more freely than a patient can do who is suffering from myelitis or a high degree of spinal congestion.

The sexual power had been gradually lost during the last six months, and the bladder and rectum likewise participated in the disease. There was great difficulty in passing water, the patient having to strain for fifteen or twenty minutes before he succeeded in voiding a few ounces of urine. Occasionally there was incontinence. The urine was habitually neutral, and contained a large excess of urea and phosphates, but no albumen or sugar. The bowels were confined, and when purgatives were administered they often acted so rapidly that the feces were voided before the patient had time to reach the commode.

The upper extremities were unaffected, with the exception of a slight feeling of numbness in the third and little finger of the left hand. The heart and lungs were healthy. The appetite, however, was very bad, and digestion much impaired; the tongue was furred. There was tenderness in the right hypochondrium, and increased dulness in the region of the liver. The patient was considerably emaciated, and had a sallow and dyspeptic complexion. He was ordered nitrate of silver, hypophosphite of soda, and podophyllin. For two months no change for the better took place; on the contrary, the helplessness increased, and there was more frequently than before incontinence of the bladder and bowels.

Towards the end of March the patient was suddenly taken with vertigo, followed by coma. There were no convulsions. The complexion became of a deeper sallow, and after a time dark brown; the tongue had a dirty brown coat; there was involuntary discharge of the excretions. The pupils were very small. The right hypochondrium was very tender, the pulse 120, the temperature 99.5°. In three hours the coma was less severe, and he was then given five grains of Plummer's pill, followed by five grains of carbonate of ammonia every four hours in mixture. On the next day the coma was not profound; the morning temperature was 100.2°, pulse 110; the evening temperature 101.5°, pulse 120. The next day the insensibility had again lessened; the patient could be roused by talking loud to him; the morning temperature was 99.6°, the evening 101.4°. On the day after that the improvement was more decided; the expression brighter, the complexion less dark, consciousness had returned; the evening temperature was only 99.2°. On the fifth day the patient eat with a good appetite, and retained the feces and urine for the first time. The temperature was 99.2°, the pulse 90. On sitting up he felt giddy.

From this time forward he rapidly improved, and a week afterwards he was again in the same condition as before this attack. The medicines he had previously taken were now discontinued, and the liquid extract of ergot prescribed in half-drachm doses three times a day. This had an excellent therapeutical influence, since under its use a steady improvement took place in all the spinal symptoms. The remedy was gradually pushed up to a drachm three times daily, and was only discontinued once for a

few weeks, after having been taken for three months, as the patient then complained of general malaise, with loss of appetite, and had a feeble pulse. The citrate of iron and quinia was then substituted for the ergot, with good results as far as those symptoms were concerned; but there was now no further improvement in the spinal disease, and the ergot was, therefore, resumed a few weeks afterwards in forty minim doses. It was altogether taken for eight months; and at the end of that time the patient had entirely recovered from all symptoms of ataxy; only the deafness and tinnitus continued exactly the same. He was discharged in February, 1877; being then able to walk easily three or four miles, and when seen twelve months later, had been able to attend to his business just as before the commencement of the affection, and had had no further attacks of vertigo or insensibility, or in fact any other ailment.

Remarks.—It is now well understood that the auditory nerve is not simply a nerve of special sense, but has a distinct relation to certain centres which regulate the equilibrium of the head and the body. These functions appear to be so divided that the cochlear branch of the portio mollis is the real nerve of hearing, while the vestibular branch of the same regulates equilibration. Section of the auditory nerve in the skull, before it has divided into its two branches, causes both deafness and loss of equilibrium. A frog whose auditory nerves have been cut, may still jump when irritated, but will not regain its proper position afterwards; it falls on its back or side, and rolls over and over without being able to steady itself. The same is seen when the semicircular canals in the membranous labyrinth are injured, while injury of the same in the osseous labyrinth produces no such effects. Pigeons, in whom Flourens destroyed these canals, heard as well as before, but showed loss of equilibrium, when the cochlea was injured. In opposition to this, Menière taught that disease of the semicircular canals alone would cause deafness as well as vertigo; but it appears now well established by the researches of Goltz, Vulpian, Crum Brown, and others, that these canals have nothing to do with hearing, but serve to maintain the normal attitude of the body. These exceedingly difficult and intricate experiments are somewhat facilitated by adopting Vulpian's plan, which consists of previously feeding the animals with madder, whereby the canals are stained bright red, and are, therefore, rendered distinct from the bones in which they are inclosed, and which have a much paler colour. Each of the three canals appears, according to the most recent observers, to have a different function. Thus, division of the superior canals causes the head to be rapidly moved forwards and backwards, and there is tendency to execute a somersault forwards, heels over head; similar phenomena being induced by lesion of the anterior portion of the middle lobe of the cerebellum. Lesion of the external or horizontal canals produces rapid oscillations of the head and eyes from one side to another, and tendency to spin round; phenomena corresponding to those after injury to the lateral lobes of the cerebellum. Finally, destruction of the posterior or inferior canals leads to rapid move-

ments of the head backwards and forwards, with tendency to execute a somer-
sault backwards, head over heels ; and lesion of the posterior portion of
the middle lobe of the cerebellum will cause corresponding signs.   That
there should be such correspondence is readily accounted for by the
microscopical investigations of Lockhart Clarke and Meynert, who have
shown that the auditory nerve is, through the restiform bodies, in direct
communication with the cerebellum, which we look upon as the central
organ of equilibration.

Integrity of the labyrinth is, therefore, shown to be necessary for the
maintenance of equilibrium of the head and the body ; and labyrinthine
impressions are shown to be more important towards securing that end
than any visual or tactile impressions, which are also concerned in it.
These impressions appear to be dependent upon variations of pressure in
the endolymph which fills the membranous canals.   Pressure or tension
of this liquid excites the terminations of the nerves in the canals and their
dilatations or ampullæ.   In accordance with the law of gravity, the endo-
lymph distends mostly those portions which lie deepest ; and the pressure
naturally varies with the movements and position of the head, so that each
position corresponds to a definite state of nervous stimulation.   The per-
ception and consciousness of this state by the brain contributes the sense
of equilibrium, and thus serves to regulate the movements of the body.
As soon, therefore, as any injury to the canals has taken place, the brain
ceases to receive accurate information of the position of the head, and is
rendered unable to calculate and direct its movements in a proper manner.
This disturbance is temporary when lesion of the canals exists on one side
only, but is rendered permanent when both sides are affected.   Loss of
one eye does not produce blindness ; and the organ of one side may by a
certain amount of training become efficient to inform the brain of the posi-
tion of the head and the body.

Dr. Ferrier[1] finds the auditory centre to be situated in the superior tem-
poro-sphenoidal convolution of the hemispheres.   When this part is fara-
dized in the monkey, there is a sudden pricking up of the opposite ear,
wide opening of the eyes, dilatation of the pupils, and turning the head
and eyes to the opposite side—signs resembling the sudden start and look
of surprise that are caused when a loud sound is made suddenly close to
the animal's ears ; both being indications of subjective auditory sensations.
Faradization of the corresponding part of the brain in other animals whose
habits are such as to make their safety depend upon the acuteness of their
hearing, as, for instance, the rabbit and the wild jackal, causes even more
striking effects, viz., in addition to those already mentioned, a quick start
or bound as if to escape from danger, which might be indicated by loud or
unusual sounds.   Destruction of this convolution on both sides causes com-

[1] Loc. cit., p. 171.

plete deafness ; and unilateral destruction of it renders the animal deaf on the side of the lesion.

Taking into account these several facts, we cannot experience any difficulty in arriving at a definite conclusion concerning the precise seat of the pathological lesion in the case which I have just related. It was evidently not located in the superior temporo-sphenoidal convolution, which, although the centre of hearing, has nothing to do with the equilibration of the body; nor could we consider the case one of cerebellar disease, the cerebellum being only the central organ of equilibration, but having nothing to do with the sense of hearing. The lesion must therefore have been seated in the auditory nerve, which presides over both hearing and equilibration, and destructive lesions of which will cause deafness as well as vertigo.

At what part of the anatomical distribution of the portio mollis was, then, the disease located ? Evidently not at its root in the medulla, because there it is contiguous with the sentient root of the fifth nerve, and there would therefore no doubt have been anæsthesia of the face together with deafness. A case of this latter kind has been described by Professor Moos, in the American *Archives of Ophthalmology and Otology*.[1] Nor was it likely that the nerve-trunk was affected, where it emerges from the lower borders of the pons Varolii. I believe this portion of the nerve to have been healthy, because there was galvanic response on applying the voltaic current to the ears ; and such response appears to be absent in destruction of the nerve-trunk. We are therefore led to the conclusion that the disease affected the labyrinthine expansion of the nerve, comprising the branch for the cochlea as well as for the vestibule.

The last point we have to consider is the nature of the pathological lesion in the labyrinth. This I believe to have been an acute inflammation, as there was a period extending over rather more than a month in which there were evident signs of special hyperæsthesia of the labyrinthine expansion of the nerve, which were followed by special and permanent anæsthesia. These symptoms correspond very closely to those which I have observed in acute olfactory and trifacial neuritis. The bad form of indigestion, with nausea, loss of appetite and giddiness, with which the illness commenced in the first instance, was probably owing to hyperæmia of the nerve. This increased suddenly, perhaps in consequence of some particularly severe exposure to the inclemencies of the weather which the patient's occupation necessitated, to inflammation, which lasted the usual term of acute neuritis, viz., from four to five weeks. The *gradual* loss of hearing during the period just mentioned speaks against hemorrhage in the labyrinth, in which deafness is more suddenly developed. The cord-affection which followed the attack of auditory neuritis, was likewise of a more markedly inflammatory character

than is usual in ataxy, as the symptoms became developed with far greater
rapidity than is seen in the large majority of cases. The intercurrent
attack of illness, which the patient had at the end of March, while in the
hospital, was in my opinion owing to an attack of hemorrhage into the
labyrinth. This attack commenced with sudden loss of consciousness,
accompanied with some rise in the temperature, and left no further traces.
The hearing having already been completely destroyed, no further damage
could be done in that quarter.

III. *Perineuritis of the Portio Dura.*—One of the commonest affections
of the cranial nerves is paralysis of the portio dura, more especially that
form of it which is caused by the sudden influence of cold, and the more
prominent symptoms of which are so well known that I need not describe
them here.   There are however several points connected with this affec-
tion on which still much obscurity prevails, and to which I will briefly
refer in the hope of contributing somewhat to their elucidation.   I will
however confine myself in this place to a consideration of that form of
facial palsy which I consider to be owing to rheumatic perineuritis of the
nerve, without going into other forms of the complaint which are produced
by injury, such as wounds, surgical operations about the face, application
of forceps during delivery, or by pressure from neighbouring parts, such as
abscess, swollen glands, tumour, periostitis, and paralysis from central
lesions.

Although post-mortem examinations of cases of rheumatic perineuritis
of the portio dura are as yet entirely wanting, yet there can be no doubt
that this palsy is really owing to an inflammatory swelling of the peri-
neurium of the nerve, with more or less considerable effusion of lymph.
This is shown by the mode of its onset, which is generally sudden, after
some unusual exposure to cold ; while in some cases it is only established
a day or two after the cause has acted.   In the commencement there
may be pain about the face, headache, twitches in the affected muscles,
and tinnitus aurium ; but as the portio dura is almost exclusively a
motor nerve, there is naturally much less pain than occurs in neuritis of
purely sentient or mixed nerves.   The principal symptom is therefore the
palsy, which is more or less severe and extensive according to the inten-
sity of the cause which produces it, the condition of the patient at the time
he becomes subject to the affection, and more especially according to the
anatomical seat of the lesion.

Broadly speaking, we may divide all these cases into two large classes,
viz., those where the inflammation occurs outside, and those where it
occurs inside, the Fallopian aqueduct.   In external perineuritis which
affects the nerve immediately upon having emerged from the stylo-mastoid
foramen, the pressure of the inflammatory swelling upon the contents of
the nerve-tubes is not very great, as the nerve is there surrounded by soft
parts, and therefore not so apt to be injured by squeezing ; and in conso-

nance with this we find that facial palsy from external neuritis generally gets well in two or three weeks. The most prominent symptoms of this variety of the affection are palsy of all the facial muscles of one side, and loss of reflex excitability in them on irritating the conjunctiva, the eyes, or the skin of the face. The electric response of the muscles, both to faradization and galvanization is normal, and there is an absence of all symptoms implicating the senses of taste and hearing, and the soft palate.

That the seat of this external perineuritis is not in the peripheral branches of the nerve, or the pes anserinus, but in its trunk shortly after it has left the skull, is plainly shown not only by the paralysis affecting *all* the muscles of the face, but also by there being no affection of sensibility. If the seat of the inflammation were more peripheral, some facial muscles would no doubt be spared, and sensation in the face would suffer, from the intimate connection which exists between the branches of the facial and the fifth nerve. A final proof for what I have just advanced is, that in some few patients of this class paralysis of the small muscles which move the ear, has been observed. These muscles are supplied by the posterior auricular nerve, which is the first branch given off by the portio dura after its exit from the stylo-mastoid foramen, and which also gives a twig to the posterior belly of the occipito-frontalis muscle. Most people indeed are unable to move their ears, but some few can, and in some of them inability to move one ear has been observed under these circumstances.

The second large class of cases of facial palsy is that which is owing to *internal perineuritis* affecting the nerve at some point during its transit through the Fallopian canal. In such cases the cause and degree of the inflammation may be exactly the same as in external perineuritis, yet the results are more serious, for the nerve is there no longer surrounded by soft parts, but inclosed in rigid walls. The same amount of swelling will therefore give rise to a much more severe compression of the contents of the nerve-tubes, and thus cause more degeneration and atrophy in the same. The prognosis of internal perineuritis is therefore much less favourable than that of the external variety of the disease ; and it is an interesting fact that by a careful electric exploration of the affected nerve and muscles we are enabled, within the first week or two, to determine with a great degree of accuracy whether the patient is likely to recover quickly, or only within three or six months. In internal perineuritis where there is more squeezing, we discover, generally within eight or ten days from the commencement of the affection, and sometimes even sooner, that peculiar alteration in the voltaic and faradic excitability of the nerve and muscles which I have called the *wasting-test*, and to the importance of which in the diagnosis and prognosis of infantile paralysis I recently directed professional attention.

The distinctive feature of the wasting-test is, that the induced or faradic current loses all influence upon the paralyzed nerve and muscles,

so that on comparing the two sides of the face in this particular, faradization of the portio dura and all the individual muscles of the face will cause these to move on the *healthy* side, but remains ineffectual on the *paralyzed* side.   Again, the constant voltaic current loses in a similar manner its influence upon the *nerve*, but acquires increased action over the individual *muscles* which are paralyzed.   It is therefore seen that a constant current which is too feeble to produce an effect on the *healthy* muscles causes the *paralyzed* ones to move very readily.   This fact was first pointed out by Baierlacher.   At the same time the character of the voltaic contraction is altered.   It does not occur with that lightning-like rapidity which it assumes in the healthy muscle, but is sluggish, inert, tardy, and recalls to one's mind those muscular contractions which one sees in physiological laboratories in frogs, whose nerves have been paralyzed by woorara or coniine.

These phenomena are only present where there is muscular wasting owing to nerve-lesions, so that the term "wasting-test" appears to be an appropriate one to designate them.   The absence of the wasting-test is characteristic for external, and the presence of it for internal, perineuritis; the reason for this being that in external inflammation there is less pressure on the nerve, and consequently no muscular atrophy, while in internal inflammation the nerve is thoroughly squeezed, and thereby loses its nutritive or trophic influence upon the muscles supplied by it.   In the former case, therefore, the patient generally gets well within two or three weeks, while recovery will in the latter be protracted over from three to six months, and even more ; or the nerve may not recover at all, but the paralysis may, in its later stages, become complicated with muscular rigidity, twitches, and atrophy, which imparts a most peculiar expression to the countenance.   Such consequences are not simply owing to disuse of the muscles, for they do not occur in facial paralysis from cerebral origin, even when this has lasted much longer, but are due to the withdrawal of nutritive power from nerve-lesion.

Internal perineuritis of the portio dura may be subdivided into several forms, according to the exact spot in the Fallopian aqueduct where it occurs ; and in no other disease can we trace the anatomical distribution of the inflammation, merely from the clinical symptoms, in a more minute manner than in the one to which I am now drawing your attention.   The Fallopian aqueduct may, for this purpose, be divided into three different sections, the first of which reaches from the stylo-mastoid foramen to a point just before the origin of the chorda tympani ; the second embraces the chorda and the stapedian nerve ; and the third corresponds to the ganglion geniculum, where the petrosal nerves take their rise.   The nerve, however, may also be subject to inflammation at the base of the brain.

a. When the inflammation takes place in the first section of the Fallopian canal, below the origin of the chorda, we have the same symptoms as

in external perineuritis, viz., facial palsy and loss of reflex excitability ; but in addition to this, the phenomena of the wasting-test in the paralyzed muscles.   Erb has drawn attention to certain hybrid forms of the disease, in which the wasting-test is somewhat blurred and indistinct, there being no actual loss, but only diminution of the faradic excitability of the nerve and muscles, which latter show increased voltaic response.   This indicates that the pressure on the nerve is not very great, and that tolerably rapid recovery may be expected.   Such cases probably correspond anatomically either to a severe form of external, or to a mild variety of internal peri-neuritis in the first portion of the Fallopian canal.

b. If the *second* intra-Fallopian section of the nerve be inflamed, we find, besides the foregoing symptoms, a peculiar modification of the sense of taste, which has to be ascribed to the chorda tympani being involved in the inflammation.   The patient then experiences an acid, or metallic, or bitter, or simply a disagreeable taste, in the corresponding half of the tongue ; and on testing the anterior portion of that organ with salt, bitter, sweet, and acid substances, it is found that they are not perceived there. The back part of the tongue, which is supplied by the glosso-pharyngeal nerve, and the opposite side of the organ, the nerves of which are unaf-fected, continue as keenly sensitive to sapid substances as previously, so that the patient before the examination is often not aware that the sense of taste is impaired.   The chorda tympani proceeds from the portio dura to the lingual branch of the fifth nerve, and ends in the submaxillary ganglion.   It is, no doubt, owing to this latter circumstance that, coinci-dently with the loss of taste, there may be great dryness in the corres-ponding side of the mouth, owing to arrested secretion of saliva in the submaxillary gland.   The experiments of Nawrocky have rendered it probable that the chorda also influences the secretion of saliva in the sub-lingual gland, and that the parotid receives secretory fibres from the super-ficial minor petrosal nerve, so that the dryness of the mouth is amply accounted for.   Eulenburg has suggested that the dryness of the mouth may be owing to the mouth being always a little open, in consequence of the paralysis of the orbicularis oris, whereby the evaporation of the saliva is accelerated ; but this theory seems to me unsatisfactory, as dryness of the mouth does not occur in facial palsy from cerebral or medullary origin, where, nevertheless, the mouth is somewhat open ; and I hold, therefore, to the view that the symptom is owing to paralysis of the chorda tympani.

Another interesting symptom of neuritis in the second intra-Fallopian section of the portio dura is *hyperacusis* (or oxyekoia), that is, hyperæs-thesia of the sense of hearing, which has to be attributed to paralysis of the stapedian nerve.   This nervelet, which leaves the portio dura a little above the chorda tympani, supplies the stapedius or levator tympani muscle.   The pressure in the tympanum and the tension of the drum of the ear are regulated by two different muscles which receive their nervous

supply from two different sources, viz., the levator, which is animated by the stapedian from the portio dura, and the tensor tympani, which receives a branch from the otic ganglion of the fifth nerve. This latter muscle does therefore not participate in the paralysis, but attains increased action by removal of the influence of its antagonist. The drum of the ear, therefore, acquires a higher degree of tension, the pressure in the tympanum is intensified, and excessive keenness in the appreciation of all musical sounds is the result. These sounds appear also generally somewhat lower than they really are, besides which there is a considerable degree of tinnitus aurium and an uncomfortable sensation of pressure in the internal ear. Whenever therefore we meet with hyperacusis in affection of the portio dura, we are justified in assuming that the seat of the disease is above the origin of the stapedian nerve. This peculiar affection of hearing is entirely independent of any disease of the auditory nerve itself, and of internal purulent otitis, which are such frequent complications of facial palsy.

c. Where the perineuritis affects the third intra-Fallopian section of the portio dura, at its bend, and implicates the ganglion geniculum, near the internal end of the aqueduct, another important symptom makes its appearance. At this point the portio dura sends off the large superficial petrosal or Vidian nerve, which proceeds to the spheno-palatine ganglion, and through it to the soft palate, where it supplies the levator palati muscle. Vidian paralysis therefore causes deficient action of the velum palati, which droops on the paralyzed side, and does not respond well to reflex or electrical stimulation. In some cases it has been found deviated to the other side; and there may be difficulty of deglutition, a nasal twang in the voice, and regurgitation of liquids through the corresponding nostril. The uvula may also be found deflected either to the paralyzed or to the healthy side. We can readily understand why it should be pulled to the healthy side, from preponderance of the healthy muscle; but why should it be found deflected to the paralyzed side? Dr. Sanders has suggested that this is owing to increased action of the pharyngo-palatinus muscle, whose fibres terminate at the base of the uvula, and which is the antagonist of the levator palati. This muscle would therefore act more powerfully on the paralyzed than on the healthy side, receiving its nervous supply from a different source. The matter is, however, rendered very complicated by the circumstance that the uvula is not by any means straight in many healthy persons, and conclusions from an oblique position of it should therefore be drawn with considerable caution.

Nearly at the same level with the large superficial petrosal, the portio dura sends off the small superficial petrosal to the otic ganglion, and the external superficial petrosal to the sympathetic plexus on the middle meningeal artery; but symptoms owing to paralysis of these nerves have not yet been observed. Perineuritis in this third section of the Fallopian

aqueduct is rare, and we therefore find that the symptoms just described are absent in the majority of cases.

A common complication of facial palsy is deafness, which is owing to simultaneous affection of the portio mollis. Both nerves may be affected at the base of the brain, or there may be purulent internal otitis, in which case there is generally perforation of the membrana tympani and purulent discharge from the external ear. If the portio dura becomes inflamed at the base of the brain, where it emerges from the posterior border of the side of the pons Varolii and the lateral tract of the medulla oblongata, there are almost invariably affections of other cerebral nerves, more especially the portio mollis. This is seen in syphilitic periostitis, exostoses, and gummatous tumours, and is generally more owing to squeezing from without than to neuritis or perineuritis. Facial palsy is also observed in affections of the nucleus of the nerve, in the medulla, pons, the cerebral peduncles and hemispheres, but is then generally owing not to inflammation, but to softening, hemorrhage, tumours, etc., and does not therefore fall into the sphere of the present paper.

The *prognosis* of perineuritis is generally much more favourable than that of neuritis, because in the former, although there is pressure on the nerve-tubes, yet the cylinder axis generally escapes destruction, while in the latter the whole of the contents of the nerve, including its central core, is destroyed. Thus we find that almost all cases of facial palsy ultimately recover, while olfactory and auditory neuritis are rarely influenced by any treatment. It is true that these latter cases are generally only specially treated after the inflammation has subsided, and when the nerve-tubes are left in a state of hopeless decay.

If a case of acute neuritis is recognized in the beginning, it should be treated according to general principles, *i. e.*, by leeches, blisters, and the application of ice as near as possible to the seat of the disease. This should be combined with the internal administration of calomel and opium, in doses of one grain each, several times a day. After the acute stage has subsided, a stimulating treatment may be resorted to, more particularly by the application of the constant voltaic current to the suffering nerve. Iodide of potassium may also be given, although its usefulness in such cases appears very doubtful. For perineuritis the same rules hold good as for neuritis, and are fortunately more effective in practice.

A VERY large number of cases of sympathetic ophthalmia have been
recorded and much has been written upon the subject, but the following
cases may perhaps be of sufficient interest to report because the disease
assumed an unusual form, or one, at least, which has received compara-
tively little attention.

CASE I.—K. W., a healthy girl of eighteen, from the country, was ad-
mitted to the Wills Hospital Feb. 11th. She had been blind in the right
eye for many years, and for the past week had been much alarmed by a
rapidly increasing dimness of vision in the left. The right eye had been
injured by a blow from a stick in early childhood, and since then it had
been quite blind, frequently irritable and occasionally painful. No other
history could be obtained. The other eye had never given any trouble
before the present occasion. There was disorganization with phthisis of
the right eye, apparently the result of panophthalmitis. There was no
pain at the time of the examination, but the ball was tender on pressure.
The left eye had presented no other symptom than dimness of vision, its
external appearance was perfectly natural, and there was no tenderness
on pressure. Ophthalmoscopic examination showed the disk swollen and
its margins obscure, the veins engorged, and a number of the whitish spots
about the macula characteristic of albuminuric retinitis. The probability
of Bright's disease suggested itself at once to every one who examined the
fundus, but the urine was found to be perfectly normal. Vision $= \frac{18}{126}$.

The disorganized bulb was enucleated on the 13th. All other treat-
ment was purposely avoided until the effect of the operation could be ob-
served, and on the 15th vision was found to have increased to $\frac{18}{70}$. The
artificial leech was afterwards applied to the temple on two occasions and
Potass. Iod. and Hydrg. Bichl. were administered. On the 17th V. $= \frac{18}{50}$.
She continued to improve steadily, and at the time of her discharge, April
3d, V. $= \frac{18}{25}$, or nearly up to the normal standard. An ophthalmoscopic
examination made at this time showed a marked change in the fundus.
The disk was nearly normal, the swelling all gone, and the margins only
slightly indistinct in places. No œdema of retina; vessels normal; still
a number of whitish spots scattered about the macula.

The enucleated ball was set aside for examination, but was unfortu-
nately lost. For the notes of the second case I am indebted to Dr. S. D.
Risley.

CASE II.—"J. B., æt. 39. One month ago, while using hammer and
iron chisel, received a fragment of steel from the hammer head in the left
eye, which pierced the sclera about 3′′′ from the inner corneo-scleral junc-
tion. Eye remained painful for two days afterwards, but is at present
painless. T. $= -2$. Red and tender to the touch; no perception of light.
Eye-ground cannot be illuminated with mirror. Oblique light shows yel-
low red reflex from posterior surface of lens.

"O. D. unduly sensitive to light—has photopsia—fronto-occipital pain. No ciliary redness, but slight ciliary tenderness and slightly diminished range of accommodation. V. $= \dfrac{20}{\text{XXX}}$? with difficulty, miscalling some letters. Ophthalmoscope shows media clear, retina hazy and striated, nerve too capillary, and margins veiled. Enucleation of injured eye advised, to which he consented. The ball was subsequently divided through its vertical meridian from before backwards. Vitreous, straw-coloured and fluid; a fragment of metal $\frac{1}{4}''$ in length, $\frac{1}{8}''$ broad, ragged in outline, was found lying $\frac{1}{4}''$ below entrance wound in the ciliary body, surrounded by a mass of lymph.

"O. D. remained sensitive to light for a week or more, and the neuroretinal appearances slowly disappeared. He was discharged from further observation about six weeks after enucleation, and I lost sight of him."

This form of sympathetic ophthalmia appears to be comparatively very rare. Dr. Adolf Arlt, in a paper read before the International Ophthalmological Congress of 1876, says that it is not even mentioned in Mooren's classical work, and that he had been able to find only four cases recorded in literature. To these he added three, not before reported, from the practice of Drs. Knapp and Gruening. In only one of these seven cases was the neuroretinitis uncomplicated; in the others there was also iridochoroiditis.

I am indebted to Dr. W. F. Norris for reference to two other cases of sympathetic neuroretinitis. Pflueger[1] reports a case in which this disease occurred in the sound eye a month after the other had been destroyed by gonorrhœal ophthalmia. It was cured by enucleation of the blind eye. The other is by Hirschberg,[2] who speaks of a case of sympathetic neuroretinitis not improved by enucleation, but afterwards cured by inunction treatment. An interesting point in Pfluger's case is the fact that the sympathetic disease followed destruction of the first eye by suppurative inflammation. Several similar cases are recorded.

This gives a total of eleven cases of sympathetic neuroretinitis, in nine of which enucleation was performed. The operation was followed by cure in five cases, and by decided improvement in two, and was done in the other two without success. One of the latter, however, afterwards recovered under treatment, which probably might not have happened if the offending organ had been allowed to remain.

Examination of the enucleated balls is reported in four cases, and disease of the optic nerve was found in each. The nerve behind the ball, however, does not seem to have been examined. Such an examination might decide whether the disease has been communicated to the other eye by direct extension through the nerve, or its sheath ("perineuritis"), as some authorities have held. The section of the nerve was made as far back as possible in the case reported above, with this end in view: it is to

[1] Jahresbricht über Ophthalmologie, 1877, p. 286.   [2] Id. 1876, p. 373.

be hoped that this intention may be carried out with better luck, or less carelessness, by others.

In two of the cases collected by Dr. Arlt, the resemblance of the ophthalmoscopic appearances to those found in albuminuric neuroretinitis is noted. The large proportion of three out of eleven cases presenting this appearance is interesting. A similar condition has been found in several reported cases of neuritis from intracranial tumour. In such a case, recently under observation at the Wills Hospital, the urine was found to be perfectly normal. Though the ophthalmoscopic picture was perhaps not in any of these cases what could be called typical of albuminuric neuroretinitis, it was sufficient in all to excite strong suspicion of Bright's disease of the kidneys. As the urine is frequently albuminous in cases of intracranial tumour, it has been a question whether the retinal changes in such cases might not be the result of secondary or incidental kidney disease, but this consideration may be excluded in sympathetic neuroretinitis.

The channel by which sympathetic ophthalmia is communicated from one eye to the other is still an unsettled point. As is usual in cases of doubtful pathology, the aid of the sympathetic nerve has been invoked by some authorities, but the ciliary nerves are almost universally considered the means by which the disease is propagated, as it usually manifests itself in the whole or a part of the uveal tract—the iris, ciliary body, and choroid. Though this view has no anatomical basis, as morbid changes in these nerves have been found too rarely to have any significance, still, here, as in other parts of the body, nerves may be the medium of communicating diseased action without presenting any changes in their own structure: the "reflex inflammation" of Brown-Sequard and others. Mackenzie thought that the optic nerves were the chief medium through which sympathetic ophthalmia was excited, and that the inflammation always commenced in the retina and only secondarily involved the other textures of the eye. Though this view was long ago entirely abandoned, there is reason to suppose that disease may, occasionally at least, be propagated in this manner. Dr. Arlt, in the statistics of nearly one hundred and fifty recorded cases in which eyes enucleated for the relief of sympathetic ophthalmia had been examined, found that the optic nerve and retina had been diseased in about 80 per cent., and thinks that sympathetic ophthalmia may not unfrequently originate in neuroretinitis, and be transmitted by the optic nerve. This is an interesting pathological question which deserves further elucidation. In the first case just reported and the other referred to in which the neuroretinitis of the eyes secondarily affected existed alone, uncomplicated with inflammation of any other part of the organ, it is not easy to understand how the ciliary nerves could be held responsible.

Other facts have been observed which tend to confirm the possibility of

neuritis being transmitted in this way. Dr. Colsman,[1] under the head of "Neuritis Migrans," reports three cases of secondary optic neuritis occurring in a sound eye after the extirpation of a diseased one, and believes that the inflammation was propagated through the connective tissue space between the outer and inner sheaths ("lymph space"), through the chiasm, to the sound eye.

Though "neuritis descendens" may be considered a fixed fact, and optic neuritis has frequently resulted from intracranial causes, I believe there is no positive proof of an ascending neuritis extending from the eye to the brain ; but cases are on record which make such an occurrence probable. Cases have been reported of meningitis following enucleation, ending sometimes in recovery[2] and sometimes in death. At least six of the latter are recorded,[3] and Graefe, on account of this danger, advised against enucleation in the acute stage of suppurative panophthalmitis. Pagenstecher, who reported one of the fatal cases, made a careful examination of the optic nerves and found them normal. He thinks the meningitis was set up by the purulent choroiditis and not by the operation. For fourteen days before the operation there had been sleeplessness, loss of appetite, and intense headache, and sympathetic ophthalmia had existed for five days. The patient was much relieved at first, but had a violent chill twenty-four hours after the operation, and seventy-four hours after the operation died of meningitis. In another of the cases, by Just, the symptoms of meningitis did not appear until eight days after the operation. No post-mortem. In still another case, Horner[4] found meningitis which could not in any way be traced to the enucleated eye. No detailed account of the other three cases could be found.

Six cases is a very small proportion of the enormous number of enucleations performed in the last twenty or thirty years, in many of which it may be taken for granted that the eyes were in a state of suppurative inflammation, and, unless we suppose that there has been a fatal result in many unreported cases, the accidents have been scarcely numerous enough to disturb the prevalent opinion that the operation is almost free from danger. Cohn[5] reports three cases in which he performed enucleation during the acute stage of suppurative panophthalmitis without unpleasant results, and seems inclined to throw the weight of his authority against the caution of Graefe. Arlt[6] says : " Should, however, panophthalmitis be already established, the operation of enucleation cannot be considered free from danger."

[1] London Med. Record, Oct. 15, 1877, p. 421, and Berliner Klin. Wochenschrift, 1877, No. 12.

[2] R. L. O. H. R., Dec. 1877, p. 252.

[3] Annales d'Oculistique, Nov. 1873, p. 253, and Jan. 1875, p. 15 ; Klinische Monatsblätter für Augenheilkunde, 1872.

[4] Schussverletzungen des Auges, H. Cohn, p. 12.   [5] Ibid.

[6] Injuries of the Eye, Am. ed., p. 156.

Enucleation gives the patient so much more certain and immediate relief from present suffering and future inconvenience and danger than any partial operation, that it is a matter of great importance to decide whether Graefe was right in forbidding its performance in panophthalmitis. Any case of death that may occur under these circumstances should be carefully reported, and an earnest effort made to establish or disprove the connection between the operation and the meningitis. While it is a significant fact that the reported deaths have all been in cases of suppurative panophthalmitis, it is to be remembered that these are just the cases in which, supposing the disease of the brain to originate in the eye, it is most possible to conceive that meningitis might have been excited without the operation. I have occasionally extirpated balls in a state of suppurative inflammation, and have sometimes had occasion to regret not having taken the risk. Two cases recently under treatment at the Wills Hospital may serve as illustrations. One, that of a man whose eye had been injured three weeks before by a piece of steel, which was supposed to be still in the ball. He suffered agonizing pain, which was only partially relieved by large doses of morphia, and was unable to leave his bed. The ball was enucleated and found not to contain a foreign body, but there were abscess of the vitreous, irido-choroiditis, and beautifully marked neuritis. All symptoms ceased at once, and the patient was returned to his work in a few days. In the other case suppurative panophthalmitis was excited by a rather desperate attempt to let a little light into a disorganized and staphylomatous but " quiet" eye by iridectomy. The front of the ball was abscised, but for several days there were great chemosis, enormous swelling and tension of the lids, considerable hemorrhage from the choroid, and pain almost as severe as before the operation, and a suppurating cavity remains which is likely to require treatment for weeks.

It is now so well established that enucleation is the only safe remedy for sympathetic ophthalmia that it is scarcely necessary to refer to it in that connection, but a glance at the history of the operation may be not without interest.

Mackenzie is usually credited with being the first to call attention to sympathetic ophthalmia and to recommend the extirpation of an injured eye to save its fellow, but Hirschberg,[1] in an " Historical Notice on Sympathetic Ophthalmia," makes a claim of priority for Von Ammon. He says : " Mackenzie, Beer's great pupil, undoubtedly deserves great merit for his investigations on sympathetic ophthalmia, and it is not my intention to detract from this merit. But I think it ought not to be forgotten that as early as 1835 Von Ammon, whose name is not even mentioned in the historical introduction to Mooren's excellent monograph, wrote the following in his prize essay on iritis : ' When an eye is wounded, and traumatic iritis ensues, the disease not unfrequently attacks the sound eye.

[1] Archives of Ophthalmology and Otology, vol. v. p. 393.

I have noted this morbid sympathy in more than one case.' " Then fol-
lows an account of two cases of traumatic sympathetic ophthalmia, but
there is no suggestion of operative treatment.

As will be presently shown, Wardrop, in 1834, was not only familiar
with the fact of sympathetic ophthalmia, but plainly suggested a treatment
practically much like that now in use, and the following extract from the
first edition of Lawrence on *Diseases of the Eye*, published in 1833, shows
that this disease was not at that time unknown to English surgeons :—

" The influence of one eye upon the other is not confined to cases of disease.
When an eye has been lost by accident, the other often becomes diseased sooner
or later, without any imprudence or any external influence that would be injurious
under ordinary circumstances.   This kind of occurrence is so common that it is
necessary to warn those who have lost an eye of their danger, and to point out the
necessary precautions for avoiding it. For this affection of the sound eye, if it
is not noticed and properly treated in the early stage, often destroys sight.   Its
most common form is slow inflammation, which may affect the iris, the retina, or
internal tunics generally."

Mackenzie in his first edition, published in 1830, refers briefly to the
subject in the following words : " We sometimes meet with severe sympa-
thetic inflammation in the eye which has not received the injury."

The operation advised by Mackenzie was free incision of the ball.   This
would perhaps be equally efficient in a considerable proportion of the cases
in which extirpation is now resorted to, but Mackenzie himself is not
known ever to have performed it.   The first hint of this practice seems
really to have been given by the London farriers.   It was known to
them that a disease frequently occurred in horses which affected first one
eye and then the other, and usually ended in loss of sight, but that if the
eye first affected suppurated and " sank in the orbit," the disease did
not attack the other.   They, therefore, adopted the practice of destroying
the eye first affected by the rather rude procedure of thrusting a nail into
the ball or applying lime beneath the lids.   Wardrop improved upon the
farriers' treatment by evacuating the lens and vitreous through an incision
of the cornea, and suggested that " in some diseases of the human eye,
when the disease makes a similar progress, first affecting one eye and then
the other with complete blindness, the practice so successful in animals
might, by judicious discrimination, be beneficially adopted."[1]   To Wardrop
then (next to the horse doctors) clearly belongs the credit of this sugges-
tion.

The object of the farriers' operation seems to have been to excite sup-
purative inflammation, and it is interesting to note, in this connection, that
Von Graefe, some years afterwards, observed this preventive effect of sup-
puration and adopted the practice of exciting it by passing a seton through
the injured eyeball.   During the life of the great Berlin oculist, and for
some time afterwards, this was a recognized plan of treatment ; but as some

[1] Morbid Anatomy of the Human Eye, 2d ed., 1834.

cases have since been reported of sympathetic ophthalmia following suppuration of the globe, it would not now be good practice.

Since the above was written the following reply to a request for information about the disease in horses referred to by Wardrop, has been received from Mr. James Law, Professor of Veterinary Surgery in Cornell University :—

"The disease is a constitutional and hereditary one, recurring at intervals of a month, more or less, and especially in young horses, excited by stabling, breaking, and, above all, teething. In a predisposed subject it may be excited by any health-disturbing cause. It often subsides permanently when teething is past, and when the severe changes that tell so on the young horse can no longer affect him. This sometimes occurs after the loss of an eye, in other cases of two, but the loss of the eyes has less to do with the matter than the changed conditions of life and the access of maturity."

It appears from this that the treatment borrowed by Mr. Wardrop from the farriers is not now in use by veterinary surgeons, but whether the practice in this particular class of cases was rational or not, it furnished the hint that first suggested the operative treatment of sympathetic ophthalmia. The chapter in which the suggestion occurs is headed, "Of the Sympathies of the Eyes," and even the traumatic form of sympathetic irritation is referred to.

There can be no doubt that Mackenzie was the first to discuss the subject fully, and to urge its great importance upon the profession, and that to him more than to any other is due the credit of giving to sympathetic ophthalmia a recognized place in the list of eye diseases, and of establishing the rational and successful treatment that is now universally adopted. Barton, of Manchester, was in the habit of slitting the cornea freely, and applying a poultice in cases where there was a foreign body in the eye, and Mackenzie closed his classical chapter on Sympathetic Ophthalmia with the following sentence : "When there is a suspicion that there is a foreign body lodged within the eye, there can be no question that the Barton operation ought to be adopted ; but even in other cases why should we hesitate to lay open an eye in which vision is extinguished if the operation affords a reasonable hope of our being thereby able to save the other ?"

This hesitation was, however, manifested for a long time afterwards even by many excellent practitioners, and the operation had to make its way against a very strong and, as it seems to us now, a very unreasonable prejudice. Among the inmates of institutions for the blind are still to be found many victims to the misplaced affection for sightless and unsightly eyeballs which in too many instances has been encouraged by medical men. This prejudice is now fortunately a thing of the past, and the enucleation of a useless eye, that is manifestly exciting disease in a sound one, is never opposed by a competent medical man, and is rarely declined by an intelligent patient. But this cannot yet be said of what has been called "preventive enucleation"—the enucleation of a ball that is doing no evident mischief at the time, but which, in all human probability, will give trouble

sooner or later—the removal of an organ that can never be useful, must always be dangerous, and is almost certain to be injurious.

When the subject of sympathetic ophthalmia was brought before the ophthalmological section of the International Medical Congress at Geneva in 1877, Warlomont, of Brussels, in view of the opposition still too often met with, even from the profession, wished to arm the specialist with the official decision of the recognized authorities in ophthalmic surgery, and, at his request, the Section confined itself to the discussion of " preventive enucleation." A free discussion resulted in the adoption of the following conclusions :—

I. " Sympathetic accidents resulting from traumatism of the eye are primary or secondary. The former appear a few days after the accident; the others at some future time—in months or years—after the patient has recovered from the immediate effects of the wound.

II. " When an eye has been destroyed by a traumatic cause, and all hope of restoring a useful degree of vision is lost, an immense service is rendered the patient by relieving him of it at once. He is thus spared the immediate results of the injury, ophthalmitis, etc., and returned in a few days to his work, and, at the same time, is preserved from the danger of consecutive accidents. When there is reason to believe that the wounded globe contains a foreign body, the indication for enucleation is still more urgent.

III. " When an eye, lost by a local cause, traumatic or other, or the stump that represents it, is the seat of a continuous or intermittent irritation, or of an acute or chronic inflammation, or contains a foreign body, or a cretaceous lens, enucleation is indicated as a preventive measure, even in the absence of any manifestation of sympathetic irritation.

IV. " The enucleation of a lost eye is indicated, even if it is completely painless, if the second eye becomes the seat of symptoms attributable to sympathy."

This verdict of the highest ophthalmological court is no doubt a just one, but it is still a question whether there are not some cases in which an eye, blind from traumatic cause, though it may not be acquitted, may have the sentence commuted to rigid surveillance. If the eye preserves its natural appearance, as occasionally happens, and the other is entirely free from suspicion of irritation, a patient who can afford the expense and loss of time of a prolonged treatment, and who can be depended upon to report instantly at the first note of warning, may be indulged in the natural prejudice in favour of the original organ as compared to the most perfect substitute : but he cannot be too strongly impressed with the risk he is taking, and with the fact that ceaseless vigilance is the price of safety. An additional consideration presents itself in the case of children, and may sometimes induce us to attempt to save an eye that in an adult had better be extirpated at once. Not only will contraction of the lids and arrested development of the orbit render the wearing of a full-sized artificial eye in after life impossible, but the development of the brow, and particularly of the malar bone, is also arrested, and a very decided deformity of the side of the face results. Of course this is a small matter in comparison with blindness, but it is worth considering in the decision of a doubtful case.

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Article V.

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Excision of the Epiglottis. By Wm. Porter, A.M., M.D., Fellow of
the American Laryngological Association, Physician to the Throat and Lung
Department, St. Luke's Hospital, St. Louis.

The literature in reference to malformations and injuries of the epiglottis
is meagre. A few instances on record, and others which are now presented,
strengthen the conclusion that in cases where this cartilage has been de-
stroyed, no important function has been in consequence greatly hindered.
Following this is the deduction that where the epiglottis is primarily dis-
eased beyond the hope of repair, it, or part of it, may be removed. The
main objection to this procedure must be, not the difficulty or immediate
danger of the operation, but the possibility of serious if not fatal results
as a sequence to interference with deglutition. The answer to this is—

1st. A diseased and ulcerated epiglottis is of itself oftentimes an ob-
stacle to deglutition.

2d. In certain affections of the epiglottis, especially when of malignant
nature, its destruction is inevitable, and involvement of the surrounding
structures certain, if the process is not previously limited.

3d. Removal of the epiglottis does not necessarily, directly or indirectly,
threaten either the life or the comfort of the patient.

If the last statement is sustained the indication is obvious, for the others
cannot but be conceded. In the normal condition the epiglottis facilitates
deglutition, especially of liquids, by dropping backwards and downwards,
forming a dome to the larynx, which is at the instant raised to meet it.
When solid or semi-solid food is to be passed into the œsophagus, the as-
sistance of the tongue is required. Cases constantly occur in practice in
which, on account of thickening or ulceration of the epiglottis, liquids
cannot at first be taken because they are liable to enter the larynx, but by
care and practice the deglutition of liquids is accomplished almost as readily
and in the same way as of solid food. In other words, the base of the
tongue may so cover the larynx as to compensate for the loss of the
epiglottis, while the larynx is further secured by being closed by the ap-
propriate muscles and folds. The epiglottis also acts to some extent as a
sounding-board, reflecting the vocal sound wave to the pharynx, where it is
in part articulated. When the epiglottis is destroyed the main objective
evidence is that the vocal sounds, such "a" and "e," are less distinct;
also the voice may be rough and harsh, if the edge of the cartilage remain-
ing is irregular and jagged. In an interesting article in the *Journal of
Physiology*, Sept. 1878, Dr. Walton attempts to prove that the epiglottis
is not essential to deglutition, even of liquids, but that it is an important
agent in the modification of the voice. The first part of this assertion is
undoubtedly true.

So long ago as 1831, *The American Journal of the Medical Sciences* chronicled two cases of loss of the epiglottis, from the *Clinique Chirurgicale* of Baron Larrey :—

At the battle of Aboukir, the famous Murat received a musket ball, which entered the neck, wounded the base of the tongue, and cut off part of the epiglottis, which was immediately expectorated. The baron passed a tube into the œsophagus for the purpose of carrying food into the stomach. "This was necessary, as there was no proper valve to prevent the ingress of substances into the trachea. In eighteen days, however, the parts had so accommodated themselves to the loss of a part of the epiglottis, that this officer was able to swallow with little or no inconvenience."

The other case is that of a soldier in Egypt, who in 1801 lost the whole of the epiglottis by a musket ball. By perseverance in the use of the elastic tube, "the life of the soldier was saved, and nature supplied the place of the epiglottis with a contrivance of her own."

Another instance is mentioned in the same journal (Apr. 1869), in the practice of Dr. E. M. Corson, in which death from inanition, on account of painful deglutition, followed the loss of the epiglottis from tubercular ulceration. In this case there was extensive ulceration of the surrounding parts, and the reporter does well to say—not that deglutition was impossible, but that it was painful.

Eberth (*Virchow's Arch*. xliii., *Am. Jour. Med. Sci.*, Apr. 1870) notes a case of congenital absence of the epiglottis, which was in a manner replaced by a small fold of mucous membrane ; with this, two lateral folds united to close the glottis. There was little, if any, disturbance of function.

I am indebted to Dr. Jos. L. Bauer, of Vinita, I. T., for the history of a case from which is made this extract :—

An orphan girl, æt. 17, is under treatment (Jan. 1878) for throat disease of long standing. Her parents, she says, both died from a constitutional disease, and the direct evidences of inherited syphilis are conclusive. The upper incisors are notched and peg-shaped, the arch of the hard palate is abnormally high, the soft palate is destroyed, on the post-pharyngeal wall are gummy tumours, and the turbinated bones are necrosed. In the larynx, the vocal cords are thickened and partially ulcerated. The epiglottis is entirely gone, but deglutition is readily accomplished. The voice has a hissing character, and her words are indistinct.

To these examples I add two from my own case-book.

CASE I.—D. A., clerk, by birth English, æt. 19, well formed and intelligent, examined May 3, 1877, gave this history : In Jan. 1874, for the first time suffered from hoarseness and pain in the throat. Six months later the pain had almost disappeared, but his voice was husky, and he had some difficulty in swallowing. During the succeeding year he expectorated freely thick yellow matter, occasionally streaked with blood. At no time had there been excessive cough, but he lost flesh rapidly for some months. For almost a year, however, deglutition has been more easily accomplished, and his general condition is evidently much improved. The only marked objective evidence of organic lesion is the rough, guttural, and somewhat monotonous voice, and sometimes stridor. By aid of the laryngoscope the result of great destruction of tissue can be seen. The epiglottis is entirely gone, and a large cicatrix occupies the site of the right ary-epiglottic fold. The corresponding arytenoid cartilage is destroyed, and the right vocal cord, though seemingly intact, is unmovably fixed to the side of the larynx. When phonation is attempted, the left cord crosses the median line till it approximates the right side, and thus the intervening space is closed. The family history corroborates the diagnosis of inherited syphilis.

CASE II.—Mr. H., merchant, æt. 53, came for advice Jan. 18, 1878, on

account of long persistent hoarseness and some difficulty in swallowing. He had contracted syphilis eighteen years before, and three years prior to the above date he had great pain in his throat, difficulty in deglutition, and foul breath. These symptoms were more or less persistent for two years, but since then have to a great extent disappeared. On examination the vocal cords are seen to be slightly thickened, and about three-fourths of the epiglottis is destroyed. The edge of the lingual portion of the valve which remains is irregular, and at one point is a narrow projection which has partly resisted the ulceration on either side. A month after the notes of this case were taken, I removed the more prominent irregularities. Since then there has not been so much obstruction to deglutition, and, succeeding local and constitutional treatment, this patient's voice is almost normal, and his general health better.

As these histories confirm my belief that the loss of the epiglottis does not necessarily destroy any important function, I had but little hesitation in treating the following case as described :—

CASE III.—Mr. P., stock raiser, æt. 44, was first seen April 10, 1878. Five months before he noticed that he had some difficulty in swallowing, and more recently there has been some pain in the region of the larynx, with pain and persistent cough. There was no evidence of either inherited or acquired disease, nor evidence of complication of the thoracic organs. With the laryngoscope a large well-defined nodule was seen occupying fully three-fourths of the free edge of the epiglottis to the left of the median line and extending into the substance of the normal tissue about three lines. One-fourth of the surface of this nodule was ulcerated, the rest smooth, firm, and not greatly congested. There was nothing abnormal in the appearance of the larynx proper, except that the vocal cords were slightly congested. For several weeks both local and general treatment was used to induce absorption, but nothing was accomplished. The diseased mass, with quite one-half of the epiglottis, was then removed on a line from the upper right margin to the lower left side, just in front of its attachment. Prophylactic tracheotomy was at first considered, so as to guard against the danger of blood entering the larynx, but was thought unnecessary, as the patient had perfect control of his throat. Anteroposterior rectangular forceps with cutting edge was used, and the hemorrhage was quickly checked by passing a sponge covered with Monsel salt over the cut surface. Semi-solid food was ordered for the subsequent week, and the profuse granulations which appeared were touched from time to time with nitrate of silver. In this case artificial aid in deglutition was not required, for, on account of the length of time during which the epiglottis had been diseased, the patient had already learned to supply its loss. The margin healed in a fortnight. At no time after was deglutition more difficult than just previous to the operation, and six weeks later there was little if any functional disturbance. The growth under the microscope was found to be of a cartilaginous character, properly belonging to Virchow's class, ecchondrose. When magnified 350 times, cartilage cells could be seen in small groups surrounded by fibrous filaments. The neoplasm was directly connected with the epiglottidean cartilage. The ulceration extended through the mucous membrane, but there was no degeneration of the tumour substance.

The result of operation in this case, the knowledge of the cases before mentioned, and the report of Dr. Herman Beigel (*Boston Med. and Surg.*

Journ., Aug. 13, 1868) of two cases in which the epiglottis was removed without loss of any function, are my arguments for this conclusion : If a benign growth of the epiglottis exist, or there is malignant disease which has not as yet implicated the surrounding parts, removal of the epiglottis, or such a part of it as is involved, is practicable and justifiable.

Article VI.

Encysted Tumours of the Eyelids and Vicinity. By Charles Stedman Bull, A.M. M.D., Surgeon to the New York Eye Infirmary and to Charity Hospital, New York.

These tumours belong to the class of retention tumours, that is cysts which are formed by a particular secretion, the product or at least the result of the activity and metamorphosis of tissue.   The most important feature in this class of growths is the collection of the secretion.   In two classes of these retention tumours, both of which presuppose the existence of an open space, there may be a different mode of origin.   In one the lining membrane of this space may secrete the contents in one and the same spot, as occurs sometimes in minute gland ducts.   In the other class, the secretion is poured out by the membrane or gland, but is not excreted, owing to obstruction in one or more of the passages leading from the secreting surface ; and this condition is also frequently met with in the excretory ducts of glands.   In both of these classes of cysts, the development consists in a widening of the canal into a space or sack, and here there is great difficulty in deciding whether we have to do with a dilated excretory canal or tube, or with an entirely new formation.   An examination into the histology and pathology of encysted tumours of the eyelids teaches us the impossibility of always determining their origin and mode of growth, for we never know, with any certainty, what histological combination we may meet with.   We may find in the eyelids cysts of apparently analogous nature, which on examination will prove to have originated in different ways, and are hence of varying pathological importance.   This it was that led to the doctrine propounded by Bichat, and adhered to for many years, that the cellular tissue was the natural place of origin of secretions or exudations of most varying nature, and that cysts were nothing more than the dilated or distended spaces in the connective tissue.

Another point which has perhaps led to mistakes in diagnosis of the mode of origin is the alteration which may and often does occur in the character of their contents.   Cysts of the eyelids not uncommonly undergo a change in their contents.   A secretion, which at first was solid or nearly so, may become gelatinous and even fluid, either from an actual change in the process of secretion, or from a breaking down of the mass already

secreted, either by retrograde metamorphosis or actual suppuration ; so that in course of time the original character of the contents may be entirely lost.   For example, the sebaceous or colloid contents of a cyst may become coloured from repeated hemorrhages, and also more fluid.   Cysts in the eyelids, as elsewhere in the body, may be " barren" or proliferous, that is, the contents may consist of fluid or unorganized matter, or of organized material.   Barren or simple cysts may be either serous, or bloody, or colloid.   According to Paget these cysts may originate in three different ways.   They may be formed by the enlargement and fusion of the spaces or areolæ in fibro-cellular, areolar, or other tissues; the secretion accumulates, the boundaries of the spaces are worn down and pressed together, and finally there is a perfect cyst, the walls of which continue to secrete.   Secondly, some are formed by dilatation of natural ducts or canals, as the sebaceous or epidermal cysts resulting from enlarged hair-follicles.   Thirdly they may be formed by the enormous growth of new-formed elementary structures, like cells and their nuclei.

The class of cysts known as sebaceous or epidermal are not uncommon in the eyelids.   Many of them result from overgrown or distended hair-follicles, but some of them are certainly of autogenous origin.   These sebaceous, or epidermal, or dermoid cysts form by far the larger number of encysted tumours occurring in the eyelids.   When of any size, the cyst wall usually consists of well-developed fibro-cellular tissue, that is connective-tissue fibres and nuclei, arranged in one or more layers.   The cyst-wall or membrane is generally firmly connected with the neighbouring tissues, so that the cyst is with difficulty removed.   According to Rokitansky the large cysts of this kind have no epithelial lining, while Paget states that they are usually lined with tesselated epithelium.   The cyst-wall may attain any degree of thickness, may become calcified in whole or in part, or may undergo fatty degeneration.

The simple serous cysts may occur in the eyelids, but are more common in and beneath the conjunctiva.   Their origin is not always easy to determine and sometimes is very obscure.   They are often congenital but are sometimes met with late in adult life.   One class of these cysts is sub-conjunctival, and has been discussed in a short paper by the writer, published in the *American Journal of the Medical Sciences* for January, 1878.   Hunter (*Pathol. Catalogue Museum Coll. Surg.*, vol. iv.) relates the case of a subconjunctival cyst, situated between the orbital margin and upper lid, which contained pure oil, and Schuh (*Ueber Pseudoplasmen*) reports two similar cases occurring in the same region.

The so-called " colloid" cysts are also met with in this region : that is, cysts with semi-solid, gelatinous contents, but they are far less frequent than the serous cysts.

These two last varieties of cysts are difficult to understand from a pathological standpoint.   It is not possible to say whether the oil or the colloid

matter is secreted as such, or whether they are the results of a breaking down or degeneration of contents of a different nature. We know that diversity of contents may sometimes depend on difference of origin, but it is a general rule that cysts are apt to degenerate, and the larger a cyst grows, the less organized are its products. It may also be said that the longer a cyst has existed, the less organized are its contents, and hence in the case of the oily and colloid cysts, the probabilities are that their contents have undergone degeneration.

Dermoid proliferous cysts very often form in the subcutaneous tissue of almost any part of the body, and are usually congenital. They are not uncommon about the eyebrow, and according to Lebert (*Abhandlungen*), their inner surface is often perfectly cutaneous.

Paget regards them as very commonly hereditary, but this admits of some doubt.

The cutaneous character of the interior of these cysts I have never been fortunate enough to observe, perhaps, because I have seen but few in young children. In adult life, particularly if the cysts have existed for a long time, this cutaneous character certainly is not present, and it is impossible to say whether it ever existed. If it did, it underwent degeneration during the growth of the cyst. The presence of short hairs in the cyst is perhaps a proof of the presence of skin tissue at some earlier period of existence. Some modern authorities hold that these sebaceous or epidermal cysts which appear late in life are imperfect imitations of the same tumours met with in the fœtus and young child, and this may be the true explanation of the difference. It certainly seems a rational one.

The hair bulbs and sebaceous glands of the skin are very often the seat of tumours, which sometimes grow to an enormous size, and the relation of the hairs to the bulb and sheath will afford an explanation. The growing hair, in its passage from the bulb to its exit from the skin, is surrounded by a sheath, which at its narrowest part is perforated by the opening of the sebaceous gland. A slight swelling of the connective tissue beneath the epidermis, or a slight increase in the amount of secretion of the epidermal cells, is sufficient to clog the sheath and its opening. Then follows naturally the retention of the secretion and later the formation of a retention cyst. Rindfleisch gives a very clear presentation of the case. According to him, the hair bulb is much wider at the base than in the excreting duct or sheath, and hence the secretion of the wall of the follicle meets with an obstacle to its excretion in this very wall, and the fact that the cast-off cells of epidermis do not remain at the bottom is due to the continued growth of the hair, which carries them along in its progress toward the surface; or, as Rindfleisch expresses it, the hair sweeps out clean its own channel. It is easy to see that a very slight obstruction will effectually put a stop to this, while the process of secretion is still going on.

Now if we look at the eyelids, we will find a structure filled with hair bulbs and glands, and hence we should infer that these sebaceous tumors occur very frequently in this region; and this is so. The small hordeola or styes and the larger chalazia, which occur so often in the lids, are tumors of this character, with sebaceous contents, but no hairs. They are caused by a stoppage of the canal by an increased secretion, which thus becomes at once the cause and effect of the distension of the follicle. Some of these larger tumours were formerly called atheromata, and are almost always acquired. Here the upper lid seems to be the preferred site, and there may be several on the same lid. Their growth is sometimes very slow, sometimes rapid, and their contents vary with the duration of the process, from a sticky, adhesive mass to a cheesy or waxy consistence. They are said to occur more frequently in persons who are exposed to great changes of temperature and weather, such as sailors and lower class laborers. The tendency to multiplication in these tumours is very marked, and relapses are frequent.

Distinct from these are the hyaline cysts, which often develop on the skin of the lids, either with or without simultaneous conjunctival irritation. These are very small, not larger than a poppy-seed, and are usually accompanied by photophobia and more or less lachrymation. They seem to be collections of fluid beneath the epidermis or epithelium, for they are usually met with along the edge of the lid, where skin and mucous membrane meet. Their pathology is still an unknown field, for on being pricked they disappear, and do not form again.

True dermoid cysts of the lids may be regarded as generally congenital. They are said to be usually situated on the temporal side, near the eyebrow, and may contain a serous fluid, or a semi-solid atheromatous matter, and occasionally hairs, which grow from the inner wall of the cyst. They often lie in the lid entirely underneath the orbicularis, may penetrate to a considerable depth, so as to involve the entire thickness of the lid and reach the cavity of the orbit, and may be attached firmly to the periosteum. In such cases treatment demands extirpation by a free incision, the external wall of the cyst being carefully dissected out down to its deep attachments. If the cyst wall be punctured during the operation, the removal of the cyst is rendered extremely difficult, but must be persisted in until it is entirely completed; for if part of the cyst is left behind, obstinate suppuration may and generally does ensue, which delays for a long time the closure of the wound, and may induce serious secondary inflammation in the orbit.

Richet (*Recueil d'Ophthalmologie*, Jan. 1874) records an interesting case of dermoid tumour of the upper lid of a man, æt. 46. The growth had existed since early childhood, and was probably congenital. It was situated at the internal angle of the right upper lid, was as large as a hazel-nut, and lay between the eyebrow, root of the nose, and internal

canthus, reaching as far down as the internal canthal ligament, but no farther. The man had been treated twenty-two years before in the Lyons Hospital, where the tumour had been crushed, and compressive forceps employed to bring about adhesion of the walls of the cyst, but the tumour soon reappeared and grew again. The fact that the tumour did not extend below the canthal ligament, Richet regarded as a very important point in differentiating the growth from lachrymal and prelachrymal tumours. The growth was fluctuating or soft, and not lobulated. The overlying skin was covered by a network of enlarged veins, and so thinned that the yellow contents could be recognized. The skin was adherent to the cyst, and the cyst was adherent to the deep tissues and to the frontal bone. On attempting to introduce the finger between the tumour and the orbital arch, a depression was discovered, which proved that the tumour lay in a shallow cavity in the frontal bone, which had probably been hollowed out by long-continued pressure. It was not a lipoma, for fatty tumours are not so soft or doughy, and are usually lobulated. It was evidently not malignant, for it had existed since infancy, and yet had not involved the other structures in its vicinity. Hence Richet regarded it as a dermoid cyst, containing some of the elements of skin, such as hairs.

Dermoid cysts situated in this region are very apt to be imbedded in the bone, and this must be recollected in operating upon them. The prolongation which penetrates the frontal bone must be dissected out and removed entire ; or if this is not practicable, some caustic agent, like zinc chloride, must be employed.

Ormsby (*Medical Press and Circular*, April 16, 1873) reports a somewhat similar case of an acquired tumour in a woman, æt. 58. This tumour began to grow four years before, making its appearance as a small swelling in the upper lid at the internal angle. It had reached the size of a hazel-nut, and had to be dissected out carefully down to its bony attachment.

As a contrast to these two cases may be cited a case reported by Kufferath (*Presse Méd. Belge*, No. 41, 1877). The cyst was in the lower lid, was as large as a pigeon's egg, and had formed within two years. It was easily shelled out through a simple incision, and proved to be an atheroma with thickened walls and granular, cheesy contents, containing cholesterine.

Another example of true dermoid cysts is reported by Little (*Trans. Dublin Path. Soc.*, Dec. 17, 1870), who removed a setigerous tumour as large as a walnut from the eyebrow of a young girl. The contents were of the usual cheesy material, composed of epithelial cells, fatty matter, and cholesterine, and in addition, numerous small and delicate hairs. On the inner surface of the cyst-wall were seen growing from genuine hair follicles several hairs of a similar character.

The uselessness of all other treatment except extirpation is shown in a

case reported by Planteau (*Bull. de la Soc. Anat.*, 1874). The case was a congenital cyst of the lower lid in a woman, æt. 23. It was as large as a hazel-nut, and filled with a yellowish gelatinous fluid. After puncture, injection of tincture of iodine, and drainage, on three different occasions, the cyst refilled each time, and finally had to be dissected out entire. The cavity then healed without any further trouble.

The cysts which contain hairs, either mingled with the contents or growing from the cyst-wall, are regarded as congenital, and Cramer's (*Casper's Wochenschrift*, 1845, No. 5) case is one of the earliest recorded with any accuracy. This tumour was removed from the right upper lid of a peasant, and was found to penetrate as far as the orbit, and was as large as a robin's egg. On being opened the tumour showed at least forty small hairs, some free, others attached to its inner surface, a serous fluid, and a fatty precipitate. This cyst dated from birth, but had grown somewhat rapidly during the last year.

These congenital dermoid or sebaceous cysts occasionally undergo calcareous degeneration. Sichel regards such a transformation as a great rarity, as may be seen by a reference to his article, entitled: "Considérations sur les kystes pierieux ou calcaires des sourcils." (*Annales d'Oculistique*, tome lvii.) They are of a bony or stony hardness, small in size, varying in diameter from 4 mm. to $1\frac{1}{2}$ cm., irregularly oval and always flattened. They are movable beneath the skin, but the posterior surface is almost always adherent at one or more points. They are situated beneath the derma. Sichel removed a tumour of this nature from the eyebrow of a young lady, and a chemical and microscopical examination showed that the growth was composed of lime and magnesia, deposited in the irregular cells of an abundant nitrogenous organic substance.

Rizet also reports (*Annales d'Oculistique*, tome lvii., 1867) what he calls a bony cyst of the upper lid, in a man æt. 26, who was a private in an engineer regiment. For four years there had existed upon the left upper lid a very hard, movable tumour, of unknown origin. It was situated in the centre of the eyebrow, and was partly concealed by the orbital arch when the eye was open, but on closing the eye it became quite prominent. During the last few months it had grown so as to occasion some trouble in opening the lid. By an incision parallel to the eyebrow, and by careful dissection, a bilobed cyst, weighing 0.3 decigramme, was with some difficulty removed. It was found to be surrounded by a resisting membrane, and was divided into two pockets or sacks of nearly equal size. The contents proved to be carbonate of lime, and were very hard, giving forth almost a metallic sound when struck.

These sebaceous cysts are not always filled with sebaceous matter, as might be supposed, though the latter usually constitutes the greater part of their contents. When they are situated in the derma, and there can be no reasonable doubt of their having originated in a dilated hair bulb,

the cheesy mass is found by microscopical examination to be made up of many layers of epidermal or epithelial scales, mingled with a greater or less quantity of fat cells from the neighbouring sebaceous glands involved in the process.

But we occasionally meet with sebaceous cysts of a larger size, which from their situation are certainly autogenous, for they lie entirely beneath the skin, in the subcutaneous tissue of the part, and are cystoid new formations. All of such cysts that I have seen have been congenital, or at least appeared in infancy, have been of large size, and were all situated at the external angle of the eyebrow and lapped somewhat upon the temporal region. They appear to be of slow and steady accretion, growing with the general bodily growth, are painless, and apparently never undergo any inflammatory reaction. The pressure which these cysts exert upon the neighbouring parts, but especially upon the parts beneath, is sometimes very considerable. This may be due to the fact that the skin in this region is much thicker than in the eyelid, and perhaps resists the growth of the tumour better. Another reason may perhaps be the presence of a firm, unyielding base, the frontal bone, on which the growth rests, which does not exist for the cysts in the eyelid. It is certain that under the influence of this constant pressure, the bone atrophies or at least grows thinner, leaving a hollow in which the tumour lies.

Rouget and Lebert even cite cases in which an actual perforation of the underlying bone has been the result of this long-continued, steady pressure. These tumours have a very well-defined thick cyst-wall, and are usually very firmly adherent to the surrounding connective tissue, and especially so to the underlying periosteum. Their deep situation, underlying the skin and fibres of the orbicular muscle ; their relations to the broad ligaments of the eyelids, which in any operation should be preserved uninjured so as to prevent extensive inflammation from starting in the cellular tissue of the orbit; their mobility, which is more apparent than real, and the deep adhesions which they contract ; all contribute to render an operation for removal a somewhat delicate procedure. If the cyst is opened prematurely, the wall can no longer be removed entire except by a lengthy and tedious excision in strips. For such cases as these the fixation forceps of Duplouin (*Bull. et Mem. de la Soc. de Chir. de Paris*, April 5, 1878) might prove serviceable. The instrument consists of two delicate, sharp blades or branches, 7 or 8 centimetres long, slightly bent from before backwards, and mounted in a convenient handle. They diverge from the heel of the instrument towards the point, so that the angle of separation is three times larger than the angle of union of the blades. Their action is simple. Before incising the skin, engage the blades beneath the cyst, the convexity of the blades towards the orbital arch, and by pressure, bring the cyst forwards between the blades and towards their point of union, to a greater or less extent, according to its size,

until it is seen to be firmly fixed.   Then incise the skin and fibres of the orbicular muscle overlying the tumour, if any such there be, and expose the cyst, which pressed forwards by the forceps, would probably be dissected out with comparative ease.   The pressure of the blades of the instrument also prevents much hemorrhage from the divided vessels during the operation.

Leaving now the consideration of these sebaceous cysts for the moment, we will consider briefly a very rare form of growth which has been met with in the eyelid, which can scarcely be regarded as a cyst, for it has no distinct wall.   Its mode of origin is very obscure and almost entirely conjectural.   I have had no personal experience of this class of growths, and there are exceedingly few cases reported.   They are glandular in nature, and the best description of one has been given by Mr. Nettleship (*R. L. Ophthalmic Hosp. Rep.* vii. 2).   The growth was situated in the left upper lid of a young girl, æt. 11; was about as large as a raspberry, and had been growing for a year.   It projected from both cutaneous and conjunctival surfaces of the lid, but though the conjunctiva was adherent to it, the skin was not.   There was no undue vascularity of the overlying skin, but the inner surface of the lid was very much congested.   It was not painful nor sensitive on pressure.   On incising the tumour through the conjunctival surface, no tarsal tissue was recognized, but the growth was found to be solid and uniformly firm throughout, and its cut surface did not bleed. The tumour was then carefully dissected out and removed entire, together with the closely adherent conjunctiva.   There was no capsule to the growth, but the deep part of the tumour, next the skin, was easily separated from the subjacent muscle.   Its cut surface had a yellowish colour and finely granular structure, the individual granulations projecting slightly from the surface.   Thin sections under the microscope showed that it was composed of very numerous gland follicles, with a considerable overgrowth of the connective tissue elements of gland structure.   The follicles in many places were branched or furnished with secondary pouches.   Some of the follicles became elongated and narrowed as if about to pass into ducts.   The large size, uniformly firm, fleshy texture, absence of cyst wall, and relative abundance of hypertrophied connective tissue, make together a picture that is very different from the ordinary tarsal cyst.   Its mode of origin is very obscure.   From its glandular nature, it is certainly possible that the morbid process may have originated in one or more of the follicles of a Meibomian gland.   These small glandular structures being more or less completely imbedded in the tarsus, the dense nature of the latter would tend to restrain the growth of any distended follicles of a gland to a certain extent, until its resisting power had been overcome by long continued pressure, ending in atrophy.   The absence of all signs of the tarsus in the region of the tumour, unless we are to regard the hypertrophied connective tissue as the tarsus, could be naturally explained by

this mode of origin and course of the growth.   Perforation of the tarsus
is not an uncommon feature in tarsal cysts which start beneath the orbicu-
lar muscle.   The tumor was, however, adenoid tissue, and apparently re-
sembled some of the structures we meet with in the conjunctiva in cases
of chronic granular conjunctivitis, where there is much thickening of the
palpebral mucous membrane.

The following cases of encysted palpebral tumors have been under the
personal care of the writer, and are interesting from a pathological stand-
point :—

CASE I. *Large Tarsal Cyst with Fluid Contents.*—The patient was a
blacksmith, æt. 39.   About two years before I saw him, while working at
his forge, he had received a somewhat severe blow upon the left eye from
a small piece of iron, which his hammer in a glancing blow had struck
from the bar upon the anvil.   The piece struck the closed lids of the left
eye near the internal canthus flatwise, for although the pain was severe
and loss of sight instantaneous, there was no bleeding and the skin was
not abraded.   The lids swelled enormously, and when seen by a surgeon
some days subsequently there was evidently a great deal of subcutaneous
and subconjunctival extravasation of blood, from the man's own story.   The
swelling gradually subsided under the application of iced compresses, so
that at the end of a week he could open the eye with comparative ease.
The vision also began to return, and in a few weeks he had regained his
sight completely.   The injury had probably caused a hemorrhage into the
anterior chamber, and perhaps into the vitreous, with paresis of accommo-
dation from the force of the concussion.   He resumed his work and noticed
nothing wrong until about two months after the accident, when he became
aware of a small lump or swelling at the inner corner of the upper lid,
perfectly painless, about the size of a small pea, which grew slowly larger,
and gradually became quite a deformity, and interfered somewhat with the
action of the levator muscle of the lid.

When first I saw him the deformity was marked.   At the inner angle
of the left upper lid, occupying about a third of the transverse or long
diameter of the lid, and reaching from the orbital margin to the line of the
internal canthal ligament, was a swelling as large as a grape or cherry,
projecting forward beyond the level of the bridge of the nose, and com-
pletely filling up the hollow at the side of the nose.   It was somewhat
movable, had apparently a broad base and rounded summit, and presented
a distinct fluctuation.   The skin over it was freely movable and not at all
reddened.   When the eyes were closed tightly, the tumour seemed to re-
cede somewhat, to become again very prominent when the eye was opened
widely.   This fact, together with its distinct limitation below by the can-
thal ligament, convinced me that I had to do with a cystic tumour of the
lid, and that it was situated beneath the orbicular muscle.   The lid could
be only partially everted, but there was no sign here, or at the inner angle
of the orbit, of the external tumour.   The limiting band below, the internal
palpebral or canthal ligament, is a band of fibres which arise from the
nasal process of the superior maxillary bone, runs across the upper part of
the lachrymal sac, thence backwards and inwards towards the posterior
lachrymal crest where they are inserted.   It is plainly visible through the
skin, and is firmly adherent to it and to the underlying tissue surrounding
the lachrymal sac.   It is thus seen that any collection of fluid in the tissues

of the upper lid is prevented from passing into the tissues below at this point by this firm band of ligamentous fibres, which anchor the lids to the bone, and also serve as an origin for the muscular fibres of the orbicularis. The tumour being to the inside and above the upper canaliculus, caused a constant epiphora by pressing upon this canal and obliterating its calibre. A small incision was made along the ciliary margin of the lid, between the tarsus and skin, just external to the lachrymal punctum, and a quantity of clear, yellowish fluid evacuated and collected for examination. The swelling collapsed at once, and on the second day all trace of it had disappeared, except a looseness in the folds of the skin. The fluid was alkaline, and contained some cholesterine crystals and some shrivelled red-blood corpuscles.

Some weeks later, when I thought the case had been cured, the man presented himself again with a swelling almost as large as before, and, supposing that I had to do with a true cyst, it was decided to remove it. An excision was made through the skin, parallel to the margin of the lid, and the fibres of the orbicular muscle were plainly seen overlying the tumour. These were gently shoved aside with the handle of the scalpel, and the delicate sub-muscular fascia exposed. On attempting to divide this and reach the cyst wall the tumour was punctured and the contents escaped. An examination showed that there was no cyst in the true sense of the word, but that the fluid was collected in a cavity formed out of the meshes of connective tissue of the lid, between the orbicular muscle and the tarsus. A few drops of strong iodine tincture were then injected, the lips of the wound carefully cleansed and left open for drainage. A small amount of suppuration followed, there was very little reaction, and the wound soon closed. The fluid evacuated resembled that examined at the first operation.

Now, what was the mode of origin of this fluid cyst without a cyst wall, to give it a name? At the time of the injury there had been great extravasation of blood in the lid and conjunctiva from numerous ruptured vessels. At this point in the lid, between muscle and tarsus, there may have been one of the larger vessels ruptured by the blow, and a clot collected in the meshes of connective tissue. The solid constituents of the clot probably underwent decomposition and were absorbed, but the clear yellow fluid must have been a later exudation from the vessels or lymphatics in the neighbourhood. The presence of the few blood corpuscles may perhaps point to the elucidation of the question. The recurrence of the fluid after its evacuation certainly points strongly to the presence of a secreting surface, but a careful examination showed that there was no distinct cyst wall present.

CASE II. Female child, æt. 2, badly nourished, and of strumous aspect. The child had been subject to frequent attacks of phlyctenular keratitis. The mother states that nothing unusual was observed on the child's face at birth, but that within the first month she noticed a small swelling on the lower lid, which was hard and immovable. This continued to increase in size slowly until the child was brought for treatment. When first seen the child was suffering from a bad attack of conjunctivitis and blepharo-adenitis, and the margins of the lids were so swollen, indurated, and excoriated that in all probability this condition of affairs had existed since early infancy. At the junction of the left lower lid with the tissues of the cheek, and at about its middle, was a hard, smooth, round tumour, with flattened base. It was about the size of a hazel-nut, was somewhat firmly imbedded in the subcutaneous tissues, but could be moved in every direc-

tion with some degree of freedom. The skin was freely movable over it, showing that there were no adhesions, and was not at all reddened. The child was somewhat emaciated, so that the limits of the tumour could be clearly made out. It did not seem to involve the lid except at the lower margin of the tarsus. The lid could be easily everted, and the tumour distinctly felt though there was no prominence in the region of the conjunctival cul-de-sac. It could be distinctly determined that there was no connection between the growth and the periosteum of the malar or superior maxillary bones.

It was decided to attempt the removal of the tumour, which was probably of a sebaceous character. The child was etherized, and a long incision made through the skin parallel to the edge of the lid. The fibres of the orbicular muscle were easily made out running over the tumour, and were pushed aside with facility. The growth was then dissected out with the handle of the knife and a strabismus hook, and was removed with comparative ease, no very firm adhesion being found except at one point. There was very little hemorrhage, and the wound was brought together with two sutures. It healed by first intention, and the child was discharged on the fourth day. The tumour proved to be a true cyst, with cyst wall and dense sebaceous contents. The wall of the sac was quite thick, and the microscope showed it to be composed of several layers of dense connective tissue fibres. There were no epidermal cells to be seen anywhere on its internal surface, and no hairs either loose or growing. There were a number of fat cells and some crystals of cholesterine in the sebaceous contents. Although there were marked evidences of chronic glandular trouble in the lid, yet there was no connection traceable by the naked eye between the blepharoadenitis and the cyst. It was separated by the whole width of the lid from the swollen margin, and seems to have developed as an autogenous growth in the submuscular connective tissue of this region. The malnutrition of the patient was no doubt closely connected with its formation, but exactly how might perhaps be very difficult to define.

CASE III. *Encysted Sebaceous Tumor of Right Upper Lid.*——Female child, æt. 5 months, of large size and the picture of physical health. Born healthy, and nothing abnormal was seen until the child was about three months old. Then the mother noticed at the external angle of the upper lid of the right eye a small nodule projecting, which was freely movable and occasioned no pain. It remained unchanged for nearly a month, since which time it had increased in size somewhat rapidly. When I saw the child there was in the situation above mentioned a tumour as large as a large bean, limited below by the external canthal ligament, moderately hard and smooth, but slightly movable, but not adherent to the skin. It was so large as to produce considerable ptosis, but there was no reddening of the lid or conjunctiva, nor any sign of inflammatory action. The lid could be everted with some little difficulty, but there were no signs of the tumour on the conjunctival surface. The eyes and eyelids were absolutely healthy, and the mother stated positively that there had never been the slightest inflammation in them. A diagnosis was made of sebaceous cyst of the lid, and an operation was at once undertaken for its removal. The skin of the lid was divided horizontally, and this revealed the fact that in this case also the growth was submuscular. The wound was then enlarged, the muscular fibres were pushed aside, and the tumour then came into view. It proved to be rather firmly imbedded in the connective tissue, and some care was required in dissect-

ing it out.   Unfortunately the cyst wall proved to be thin, and was rup-
tured before the operation was completed, a cheesy mass of firm consist-
ence oozing out through the opening.   The growth was then removed
and freely laid open.   It proved to be a sebaceous cyst with thin walls,
but no fluid contents.   The wound was closed by two sutures, and healed
by first intention in about twenty-four hours, and the drooping of the lid
soon disappeared.   Here again we meet with a true sebaceous cyst devel-
oped in the submuscular connective tissue of the lid, having no apparent
connection with either skin or tarsus, and in an absolutely healthy lid.
The case is also of interest in connection with the preceding one.   In
both cases the growths were of the same nature, and yet one patient was
strumous and emaciated, with chronic glandular disease of the lids, while
the other patient was perfectly healthy.   These two cases compared toge-
ther show that clinical observation alone does not help us much in under-
standing the etiology of the growth, and suggest that a microscopical
examination of the eyelid as a whole is necessary to aid us in getting at
the root of the matter.   Horizontal and vertical sections of the lid in its
entire thickness, going well down into the tissues of the cheek in the first
of these two cases, might perhaps show some connection between the cysts
and the sebaceous glands of the lid, and thus throw some light upon their
origin.

CASE IV. *Sebaceous Cyst of the Lid, which had undergone Partial
Suppuration.*—The patient was a woman, æt. 45, with a large tumour in
the right lower lid.   The growth had made its appearance two years be-
fore I saw her, and had slowly reached its present size, without causing
any pain and only a moderate amount of inconvenience, until within a
month.   Since then there had been some dull, heavy pain, and the skin
had become swollen and reddened over the tumour.   When she presented
herself for treatment the deformity was very marked.   The tumour itself
was as large as a walnut, but the whole lid was swollen and reddened.
The tumour was immovable and the skin overlying it was adherent to it.
The growth was somewhat hard, but with an indistinct sense of fluctuation.
The lid was pressed against the eyeball, but could be pulled away, show-
ing the hyperæmic conjunctiva very plainly.   Thinking that I had to do
with a large chalazion which was on the point of suppurating, an incision
was made in the ciliary margin of the lid, between skin and tarsus, and
parallel to the latter, and the knife carried in deeply ; but none of the
characteristic contents of a chalazion were evacuated.   The hemorrhage
was considerable, but there was no pus or gelatinous matter.   A horizontal
incision was then made through the skin and orbicular muscle and the tumour
exposed.   There was apparently a wall to the sac, and an attempt was made
to dissect it out, but failed, for it was so thin that it ruptured almost im-
mediately, and a quantity of cheesy material and pus poured out from the
opening.   The sac was carefully emptied and cleansed, and an examina-
tion then showed that what had been mistaken for the wall of the cyst
was nothing more than some layers of connective tissue, which acted as a
wall to the collection of sebaceous matter.   Suppuration and disintegra-
tion had probably begun here at the centre, and had been the means of
setting up the inflammatory action throughout the lid.   The absence of
the cyst wall shows a lack of development in the growth, and the suppura-
tion shows its failure to resist disintegration.   I am inclined to think that
if the lid could have been removed and submitted to microscopic examina-
tion, some connection might have been shown with the sebaceous glands

and hair follicles of the integument of the lid. The suppurative process would soon have involved the entire tumour, and instead of a sebaceous cyst there would have been simply an abscess. This would have complicated the differential diagnosis as to the growth of the tumour, and rendered still more obscure the question of its mode of origin.

CASE V. *Encysted Tumour of the right upper Lid and Eyebrow.*— The patient was a young man, æt. 23, who stated that he was born with the tumour, and that it had increased in size with the growth of the body. At the external angle of the right eye, involving the upper lid, the eyebrow and neighbouring part of the temple, was a large, smooth, pendulous and freely movable growth, occupying the outer third of the eyebrow, hanging over the upper lid and reaching in size a large pigeon's egg. The eye was closed by the pendulous overhanging mass, but there was still some power in the levator muscle. The orbicularis acted readily and well. The tumour had a broad base which was firmly adherent to the underlying bones. The skin over it was freely movable and natural in appearance. The superciliary ridge of the frontal bone and the external angle were distinctly flattened by the pressure of the tumour, and there was a distinct depression in the bone, extending for some distance along the orbital margin and out on the temple, in which the tumour rested, where the bone had been absorbed by constant pressure. The growth did not extend into the orbit, and there was no displacement of the eyeball, nor any interference with its movements. The acuity of vision was normal.

An exploratory puncture was made with a trocar, and the contents were submitted to microscopic examination, and proved to be fat cells and cholesterine crystals. An operation was advised for its removal, but was refused, and the patient disappeared from observation.

Here was a pure case of congenital dermoid cyst, of rather unusual size. The adhesions to the periosteum were probably exceedingly firm, and the operation of dissecting out the cyst would have been attended with a good deal of difficulty. The hollow in the frontal bone in which the tumour lay may have been caused by an absorption of the bone from pressure, but as the tumour was congenital and had grown *pari passu* with the body, it is probable that the normal development of the frontal bone in this region was interfered with by the presence of the cyst, and a shallow cavity had resulted where a prominence naturally exists.

CASE VI. *Prelachrymal Fluid Cyst.*—The patient was a woman, æt. 55, who had noticed a swelling at the inner angle of the right eye for more than three years. At first it was quite small, but soon grew rapidly, and had been of about the same size for the past two years. There was no pain or any inflammatory symptom, but there was a constant overflow of tears. When she presented herself for treatment, I found a tumour about the size of a hazel-nut situated along the right side of the nose, and lying in the fossa exactly in front of the lachrymal sac, and precisely where a dacryocystitis with secretion of pus would show itself by a swelling. The skin was freely movable over it, and was not reddened or otherwise altered from the normal condition. The tumour was moderately hard and resistant, but there was an ill-defined sense of fluctuation, and the growth slipped about beneath the fingers like a marble, without moving from its base, which was firmly adherent to the subjacent parts. There was no purulent discharge from the lachrymal sac or nasal duct on pressure, but there was an overflow of tears when the tumour was compressed. Thinking that it might be a collection of tears and mucous in the lachry-

mal sac, owing to some obstruction in the nasal duct, the lower canaliculus was slit up and a probe passed into the sac, which, however, was found empty, and the probe, a No. 8 Bowman, passed without any difficulty to the bottom of the duct. It was then seen that a cyst of some sort was present, lying in front of the lachrymal sac, and having no connection with it, and an attempt was made to remove it. A long vertical incision was made through the skin over the tumour, and as the wound gaped the cyst almost immediately presented itself. The skin overlying the cyst was then slowly and carefully dissected away on all sides with some little difficulty, but on the side of the nose the adhesions were found to be very firm, and an unfortunate slip of the knife handle caused a rupture of the cyst wall, and an evacuation of an amber-yellow, oily fluid, which towards the last became somewhat greenish in colour. The cyst immediately collapsed, and the dissection of the wall, from its deep attachments, had to be done piecemeal. The wall of the cyst came away in shreds, and the adhesions to the periosteum and canthal ligament were so dense and firm that the edge of the knife had to be resorted to. After the entire cyst had been removed, and the cavity syringed out, the bone was found so denuded that it was feared the periosteum had been removed in the operation. One suture was introduced at the top of the wound and the rest left open under carbolized lint. Quite free suppuration ensued with considerable swelling and inflammation of the skin and neighbouring parts, but these symptoms gradually subsided, the cavity began to granulate from the bottom, and at the end of the third week was entirely closed.

The cyst wall, on being examined, was found to consist of several layers of connective tissue pressed together so as to make a very dense structure though comparatively thin. The inner surface was very smooth and shining as if covered by a membrane, but neither sections nor surface preparations showed any epithelial formation.

These prelachrymal cysts are rare. Verneuil reported three cases to the Société de Chirurgie de Paris, in 1876, and an abstract is given of them in a paper by the writer, published in the *American Journal of the Medical Sciences* for January, 1878, and already referred to. They have no communication with the lachrymal sac, and Verneuil considers them in most cases congenital, and states that their contents resemble olive oil. The origin of the oily contents is however unknown.

47 EAST TWENTY-THIRD ST.

ARTICLE VII.

ULCERATIVE PHTHISICAL LARYNGITIS; ITS NATURE, AND THE VALUE OF TRACHEOTOMY IN ITS TREATMENT. By BEVERLEY ROBINSON, M.D., Lecturer upon Clinical Medicine at the Bellevue Hospital Medical College,[1] New York.

UPON two occasions[2] last year I had the honour of presenting at the New York Pathological Society, specimens of ulcerative disease of the

[1] Read before the Medical Society of the State of New York, Feb. 6, 1879.
[2] April 25, and Nov. 14, 1877.

larynx, taken from patients who died in my service at Charity Hospital. These patients were both affected with catarrhal phthisis. In the first case there was found at the autopsy secondary tubercularization of the lungs, pleura, kidneys, peritoneum, and the small intestine showed scattered phthisical ulcerations. The condition of the larynx was as follows, according to the post-mortem record made twenty-one and a half hours after death, by Dr. E. A. Maxwell, one of the curators to Charity Hospital : "Both vocal cords show about their middle portion, at upper and rim borders, longitudinal ulcerations, while the rim of vocal cord is thickened. At posterior commissure of each is an irregular spot, where mucous membrane is eroded; interior mucous membrane is congested." This larynx was afterwards examined microscopically at my request by Dr. Thomas E. Satterthwaite, curator to St. Luke's and Presbyterian Hospitals, and no evidence of tubercular deposit was found. The ulcerations of the larynx were therefore considered to be catarrhal in nature. In my second case there were no miliary tubercles in any of the viscera, but the patient presented a large gangrenous cavity of the right lung. His death was probably occasioned by œdema of the aryepiglottic folds. The larynx offered the following appearances : " The tissues of the epiglottis very lax, and curving inward; its mucous membrane, just above the ventricular bands, show numerous small superficial ulcerations. The vocal cords of both sides (?) show œdema, but that of left side more marked, and so much as to almost obliterate sacculus of this side." (Spencer, Curator to Charity Hospital.)

In relation to this case I made the following remarks : " The ulcerations of the larynx are evidently catarrhal in nature, and there is, at least to ocular examination, no tubercular deposit." This opinion was fully corroborated at a later meeting of the Society[1] by the report of the microscopical committee to whom the larynx was referred, which report read as follows :—

" To external appearance there was no decided lesion of the larynx, more than that the surface of the mucous membrane was rough, especially at the base of the epiglottis, and from this point down to and over the lower vocal cords.[2] There was no decided elevation of the mucous membrane, indicative of *miliary tubercular granulations.* On section of the tissue between the epiglottis and upper margin of the upper vocal cord a number of yellow, circular spots were noticed in the submucous tissue. They looked to the eye like cheesy nodules, and varied in size from a pin's-head to a No. 2 shot. No miliary granulations were seen anywhere. Examined microscopically, it was seen that these spots had undergone granular and fatty change, as is seen in the so-called " yellow granulations." The submucous tissue was in places densely infiltrated with lymphoid corpuscles, chiefly about the mucous glands, but neither *adenoid tissue* nor *giant cells* were seen. The epithelium of the surface showed the characteristic cylindrical form that occurs throughout almost the whole of the larynx, and was intact except in

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[1] December 12, 1877.

[2] Ocular appearances had changed within a few days after the post-mortem, owing to the action of dilute alcohol, in which the specimen had unfortunately been immersed at first.

a few places, but never wholly gone. In these places the epithelium was low, deformed, and did not take the colouring matter. The elongated papillæ seen on the true vocal cords and in the posterior foldings of the mucous membrane, near the arytenoid cartilages, were normal.''

The interest of the two cases, an abstract of which I have just read, relates in great measure to two important questions : 1st question : What is laryngeal phthisis ? Is it simply the irritation and ulceration of the glands of the larynx resulting from the passage of pulmonary sputa over the surface? Are tubercles at times developed in its tissues ?

2d question : If the former belief be the correct one, or generally and nearly so, how far is it justifiable to perform tracheotomy in the earlier stages of ulcerative laryngitis of this nature as a *means of cure* ?

In reply to the first question, What is laryngeal phthisis? I shall be brief, but not too much so, I trust, to make my readers share my personal convictions. The opinions of eminent microscopists are about equally divided to-day between those who admit the presence of tubercle as *frequent* in the mucous membrane of the larynx (Virchow) and those who believe that it is there seldom met with (Rindfleisch). A few observers boldly affirm that tubercle *never* exists in the larynx (Rühle). With frequent opportunities of observation during several years past, I hold the position of not being able to discover the tubercular granulum in the larynx either before or after death, and whilst I do not positively deny its existence, I am of opinion that it must be extremely rare in this situation. The elevations which have been described in the larynx under the name of miliary tubercle, are none other, as a rule, than small spherical swellings, which are occasioned by the filling up with transparent fluid of the closed follicles of the submucous reticulum, which have been described in the normal larynx by Heitler[1] and Coyne.[2]

The liquid contained in the follicles is not long in becoming opaque, its limiting wall loses its epithelial covering, then expands, and finally breaks, leaving behind a small circular, rather superficial ulceration. These follicles are found in pathological as in healthy conditions, more frequently over the false cords, and in front of the arytenoid cartilages than elsewhere. I have not been fortunate in recognizing them often, and, on this account, am disposed to believe that they become eroded, and lose their contents very rapidly after once being formed. They have been seen infrequently on the free margin of the epiglottis, and, when there present, the prognosis, according to one accurate observer,[3] Dr. Wm. F. Duncan, of New York, has always been considered unfavourable. In this connection, and inasmuch as I myself do not remember to have seen these elevations on the free margin of the epiglottis, I would remark that the latest and most careful histological researches do not sustain Dr. D.'s view, since

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[1] Stricker's Med. Jahrb., vol. iii., iv., 1874.

[2] Recherches sur l'Anatomie Normal de la Muqueuse du Larynx, Paris, 1874.

[3] Oral communication.

they make no mention of closed normal follicles at this place.   The closed
follicles of the larynx become enlarged, doubtless, under similar conditions
with those which cause the closed follicles of the pharynx or of the intes-
tine to become prominent.   These conditions are, on the one hand, the
dyscrasic constitution of the patient, viz., catarrhal, phthisical, and scrofu-
lous ; and, on the other, the passage of secretions, occasioned by an inflam-
matory processus, over the region of their anatomical site.   But does
ulceration, even of catarrhal type, always affect the closed follicles within
the larynx?   Unquestionably not.   The racemose, multilocular glands
are also frequently the seat of ulcerative processes, especially about the
orifices of their ducts.   These ulcerations coalesce afterwards, and are
oftentimes of extensive area and irregular contour.   It may be, also, that
they at times become directly inoculated by the passage of sputa contain-
ing real tubercular débris.   It is not correct, however, at the actual date
of our information, to attach primary importance to infiltration of lymphoid
corpuscles around glands, for these latter are already present in a state of
health ; and though more numerous in the phthisical ulcerations than they
are normally, the action of catarrhal inflammation is sufficient to account
for this fact, without an attempt being made to establish the tubercular
nature of the affection.   What lends additional weight to this view of the
non-tubercular nature of laryngeal phthisical ulcerations, in the great ma-
jority of cases, are the occasional evidences of cure observed by well-
known laryngoscopists.   Cohen and Isambert, notably, have seen these
ulcerations heal and perfectly cicatrize ; and this was true, in a few in-
stances, even though the lungs were already affected with phthisis.   And
in my own city of New York, Drs. Frank Bosworth and Wm. F. Duncan
have had latterly some remarkable results which are attributed by them
to their method of treatment.   This mainly consists in repeated and very
thorough cleansing of the laryngeal surfaces by means of a carbolic and
alkaline spray (Dobell's), followed by topical applications, with mild
astringents and iodoform, combined with morphia.   I regret to add, per-
sonally, I have never been able to obtain such encouraging curative effects,
but doubtless this is properly accounted for by less methodical and rational
measures.

Before leaving my first question, I cannot forbear to cite from the
second edition of Rindfleisch's *Pathological Histology*, to show that this
learned microscopist, whilst admitting the *possible* presence of miliary
tubercles in laryngeal phthisis, nevertheless attributes to them a very sub-
ordinate rôle in the evolution of this disease.

" When we see," says Rindfleisch (p. 371), " that the most important and the
severest destructions of the *larynx* and trachea are produced *alone* by *catarrhal*
inflammation and ulceration, we reasonably ask ourselves what, then, remains
there for tuberculosis to do ?"   To this he replies, some lines further on : ' These
tubercles certainly lie so individualized and beside the inflammatory infiltration
of the real surface of ulceration, are such insignificant new formation, that I
would only regard them as a pledge of the connection of this process with consti-

tutional tuberculosis.   At the most, we might ascribe to them the valuation of a permanent inflammatory irritation, and to trace back to this the obstinacy and the tendency to relapse, which is peculiar to these catarrhal inflammatory conditions.''

Between this view, reported verbatim, and the one I hold, there is, as will be remarked, a very slight divergence.   Having admitted the usual nature of phthisical ulcerations of the larynx, what may be the value of tracheotomy in this disease?

Manifestly, in order that the best attainable results may be secured by tracheotomy, the ulcerative disease of the larynx should not be permitted to make too great progress.   In order to have legitimate hopes of benefit to the patient from this operation, the ulcerations must yet be limited in their action to the mucous membrane, or the soft tissues beneath.   When the cartilages are attacked by caries, or necrosis, and concomitant ankylosis of the articulations is present, it would be almost irrational to expect any very decided improvement from tracheotomy, much less an absolute cure.   Tracheotomy, if indicated at all, therefore, as a curative procedure, must be performed in the earlier stages of ulcerative disease, or more definitely, perhaps, at that period when the nature of the ulcerations is obvious, and local treatment appears of little avail.   And even conceding that the favourable results obtained by Drs. Bosworth and Duncan[1] should be accomplished by other laryngoscopists, I would only find stronger reasons for urging the importance of tracheotomy as a means of cure.   For what do we hope to gain by tracheotomy?   1. Rest of the larynx during respiration.   2. Prevention of frequent contact of atmospheric air in motion, and of purulent fluids, with a surface upon which they have occasioned disease, and are still maintaining it.   Now, I can but believe that if ulcerative phthisical disease of the larynx can occasionally be cured by mere topical applications, without the above imperative conditions, embodying the very first principles of surgery, much more readily and frequently must similar results follow when these essential indications are attended to as well as is possible.   We all know that we never make a single inspiratory effort unless the vocal cords, and therefore the intrinsic muscles of the larynx themselves, are put in active motion.   Suppose, then, that an ulceration be seated on one of these cords, or upon the arytenoid cartilages, with their continual slight rotatory movements, and what should we expect but constant irritation of an already inflamed tissue?   Moreover, do not the very latest investigations prove conclusively that even though there be no ulcerations, there is in pulmonary phthisis

[1] Unpublished Minutes of the New York Laryngological Society, June 13, 1878. Their statistics read as follows : 20 cases of laryngeal phthisis, treated at the Bellevue Clinic during the year ending June, 1878 ; 1 died from catarrhal pneumonia after tracheotomy ; 5 disappeared improved ; 1 disappeared, and probably died ; 5 are left with a simple catarrhal laryngitis ; 1 cured ; 6 under treatment, and improving ; 1 under treatment, and not improving.

frequent atrophy of the intra-laryngeal muscles by reason of compression of the primitive muscular fascicles, consecutive to abundant proliferation of cellular elements of the connective tissue in the interior of the muscle.[1] This fact, therefore, furnishes additional reason for giving the larynx rest from *involuntary* movements. In regard to voluntary movements, the operation must be serviceable, because the patient is less prone to use his voice when compelled to stop up the external orifice of his tube in order to articulate, than he is when no such necessity exists.

In regard to the injurious action of air and the passage of purulent fluids upon an exposed, raw surface, need I insist? How do we treat ulcers elsewhere situated? Is it not in accordance with the simplest axioms of surgical knowledge to keep them as clean as possible in so far as morbid fluids are concerned, and also to protect them from the irritative effects of air by simple or other dressings? Now let us judge the question of intra-laryngeal ulcerations by the effects of treatment. I, for one, affirm emphatically that all caustic substances are radically wrong when applied to the ulcerated laryngeal surfaces of phthisis. They only inflame them still more, thereby increasing the discomfort and pain of the patient in swallowing and breathing. Never have I known them to exercise any decided curative effects. In my own practice, in fact, I rarely, or never nowadays, employ even mild astringents in the treatment of ulcerative laryngitis of phthisis, and in this I differ with Drs. Bosworth and Duncan, but I rely exclusively for the relief of pain and irritation upon the use of anodynes such as morphia and laudanum alone, or combined with powdered gum or iodoform.[2] Now do not these remarks go to show still further the importance of removal of causes of irritation by isolation (in a certain sense)? It may be mooted whether attention to all these indications can be of much utility in ulcerative disease which is of tuberculous nature. When carried out practically they may be curative in catarrhal ulcerations. But we doubt such results, say some, in genuine tubercular ulcerations. That these latter are very infrequent, I have already stated, but when present that they will be very favourably influenced, if not entirely cured, by tracheotomy, I have good reason to believe when I consider the remarkable change in local appearances obtained in a case of epithelioma laryngis (a more unfavourable affection if possible, than tubercular laryngitis), presented within a few months by me to the New York Pathological Society.[3] Moreover, we should consider in *all* cases of ulcerative phthisical laryngitis, that tracheotomy is not merely *a* means but the *sole* means at our command of putting the larynx at rest and shielding it from pernicious contacts. Now it has been affirmed that in many of these cases

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[1] Fränkel, quoted in Revue des Sciences Med., 15 Octobre, 1878, p. 667, from Archiv. für Patholog. Anat. und Phys., t. lxxi. p. 261.

[2] The powder of iodoform has very marked anæsthetic effects upon all laryngeal ulcerations.

[3] October 8, 1878.

of ulcerative phthisical laryngitis, death does not occur on account of this
condition but rather from the presence of advanced phthisical disease in
the lungs themselves.   Besides, it is added, the intra-laryngeal affection is
wholly dependent upon the lung trouble, and if the latter were cured, the
larynx would also become rapidly healthy.   Special attention, therefore,
as regards curative measures should alone be paid to the care of the lungs,
and the larynx need not be considered as of great importance.   In answer
to this I would say that whilst many cases undoubtedly die directly from
the phthisical affection of the lungs rather than from the laryngeal ulcera-
tions, still when this affection is present it always aggravates the sufferings
of the patient and increases the probabilities of a fatal termination.   Some-
times it causes local pain and augments the severity and frequency of cough,
sometimes it increases the already existing obstruction of respiration, and
renders deglutition extremely difficult.   Occasionally all the preceding
symptoms will appear in the same individual, and thus render his or her
condition especially distressing.

   In view of these facts, I therefore maintain that when ulcerative laryn-
geal disease manifests itself in cases of pulmonary phthisis, it always aggra-
vates the primary disease and makes its march towards a fatal termination
more rapid and deplorable.   To those instances in which the intra-laryn-
geal ulcerations are only a somewhat tardy complication of pulmonary
phthisis, we are of necessity forced to give a place to varieties in which the
ulcerations of the larynx show themselves at a very early stage of impaired
health.   Frequently these forms are also associated with evident signs of
intra-pulmonary lesions.   But this is by no means a universal rule, and
I have seen phthisical ulcerations of the larynx when the existence of phy-
sical signs of lung disease was extremely doubtful, not to say, entirely
absent.   Under these circumstances, I now feel almost convinced, if tra-
cheotomy had been performed at an early date, the patient might have
been entirely cured, both of the pulmonary and the laryngeal disease.   In
other instances the submucous infiltration increases rapidly, whilst the
ulcerative disease is extending itself, and finally the thickened epiglottis
and pyramidal masses formed by the arytenoid cartilages and ary-epiglottic
folds are of such dimensions, that when acute inflammation (through expo-
sure or fatigue) becomes grafted upon the chronic disease, our only alter-
native is to perform tracheotomy, so as to relieve dangerous dyspnœa.   In
almost every case of this description it can be shown, I believe, that the
operation is not risky, if carefully performed, and is of great benefit in
speedily alleviating most of the harassing symptoms of which I have spoken
above, and perhaps in adding to the chances of the ultimate cure of the
patient.

   Are there any cases which go to prove this statement and further to in-
dicate the probable value of tracheotomy as a curative procedure in ulce-
rative phthisical disease of the larynx ?   There are without doubt, a few

recorded, and there are quite a number of which I have had oral information from members of our profession.

One of the most instructive of which I have knowledge is that of a patient presented to the members of the New York Pathological Society, at a meeting held January 9, 1878, by Dr. J. H. Ripley, surgeon to Charity Hospital.

The patient of Dr. Ripley had evident pulmonary phthisis at an advanced stage, viz., a large cavity in the left lung, with consolidation of right apex. Two months previous to being seen by Dr. R. he had become aphonic, and to loss of voice difficult respiration was soon added, and had been getting so much worse within a few weeks as to frequently awaken him at night with a sense of impending suffocation. On December 23, 1877, he was brought to St. Francis's Hospital, suffering from laboured and stridulous breathing. The face was dusky, and the pulse frequent and feeble. Tracheotomy was performed, and the relief following the operation was very great. Sixteen days later the patient's breathing was free, his appetite much improved, and his cough greatly moderated. When the tube was removed and the external wound closed, he could speak with almost natural clearness, and there was less dysphagia. Dr. Elsberg examined the larynx six hours after the operation and dictated the following : '' I find the soft parts at the entrance of the larynx much hypertrophied, and the whole interior filled with swollen, infiltrated tissue ; the aryteno-epiglottidean folds form great cushions, which meet in the median line. In my opinion, this condition would have proved rapidly fatal without tracheotomy.'' Dr. Elsberg re-examined the larynx on January 8, 1878, fifteen days after the operation. He then said, '' The swelling and infiltration of the parts have mostly disappeared ; the mucous membrane is pale, and the superficial vessels enlarged.''

'' It would seem from the foregoing facts,'' says Dr. Ripley (*Med. Record*, Feb. 23, 1878), '' that tracheotomy has in this case accomplished these results : 1. It has relieved symptoms. 2. It has prolonged life. 3. So far as the larynx is concerned, it has proved curative.''

In the debate which follows the report of the foregoing case Dr. Elsberg remarked that he had *seen* (?) tracheotomy performed five or six times, but the operation had been done by other practitioners in accordance with his advice, probably twenty times. As far as the immediate condition of the patients after the operation was concerned, the results were satisfactory. Dr. Briddon also concurred in the belief '' that such ulcerative diseases were benefited by the rest which tracheotomy could give them.''

In the minutes of the meeting of the Laryngological Society of New York, held April 11, 1878, a case of ulcerative phthisical laryngitis, in which laryngo-tracheotomy had been performed, is referred to by the operator, Dr. Wm. F. Duncan. To this gentleman I am indebted for full notes of his valuable case. From it I shall only repeat a few important points, which have direct reference to the subject under consideration.

'' At the time of operation in this instance, the lungs *appeared* sound. The intra-laryngeal condition looked hopeless. Tracheotomy was suggested as a curative measure, the idea in mind being to give the larynx rest, and after the operation to continue its local treatment.
'' March 1, 1878, operation was performed with assistance of Drs. Bosworth, Parks, and Swinburne. The immediate effect of putting the larynx at rest was to remove the pain in the throat, and to restore easy deglutition. Two days later a laryngoscopic examination was made, and the epiglottis was seen to be less

œdematous, and the swelling over the arytenoids and ary-epiglottic folds greatly reduced.   The larynx continued to improve steadily for three weeks, at which time the patient caught cold from coming out in a rain-storm.   From this period she grew worse, both as regards her larynx and lungs, and died on June 5th, of catarrhal pneumonia.

"' The immediate improvement,' says Dr. Duncan, ' after inserting the tube, would seem to warrant the expectation that it might be made continuous in a similar case.   And it should be remarked that the first interference with the improvement of the diseased larynx occurred after catching cold from exposure to a severe rain-storm.' "

To the preceding cases I shall add four others, viz., those reported by Dr. Serkowski,[1] of which an analysis will be found in the *Clinic* of September 22, 1877, and two others which have come to my knowledge through Dr. Charles McBurney, of New York.[2]   One of Dr. Serkowski's patients died three years after tracheotomy was performed, from advanced pulmonary phthisis; the other is still alive, seven years after the operation, and in apparent good health.   Dr. Serkowski believes that the opening of the trachea was not only of temporary benefit, but that it prevented extension of tuberculosis.   The first of Dr. McBurney's patients affected with ulcerative phthisical laryngitis, was operated upon by himself.   This individual died subsequently of phthisical ulcerations of the bowels, and his pulmonary phthisis was also far advanced.   In the instance just cited, besides the relief to deglutition and respiration afforded by tracheotomy, Dr. McBurney did not remark, up to the time of death, six weeks later, any very decided improvement in the intra-laryngeal appearances.   The other case, Dr. McBurney saw *once* prior to tracheotomy and diagnosed laryngeal phthisis.   Sometime after the patient returned to him with a cicatrized wound and an apparently healthy larynx.   This man had had tracheotomy performed on account of dyspnœa arising from phthisical obstruction of his larynx, and had improved so much as to be able to dispense with his tube and allow the wound of the trachea to close.   He died later on of acute pleurisy, and it was stated by the physician who performed tracheotomy that he had *not* laryngeal phthisis, and this opinion was based upon another expert examination.   This case must, therefore, remain one of doubtful signification.

Within a few days, and since writing what precedes, I have been witness of an operation of prophylactic tracheotomy in ulcerative phthisical laryngitis, performed by Dr. Morris Asch, Surgeon to the New York Eye and Ear Infirmary.   In this instance, physical signs of pulmonary phthisis are present, although the *stage* of the lung affection should still be considered doubtful and is probably not advanced.

Dr. Asch's operation took place on January 27, 1879.   Five days later, I received the following letter from the House Surgeon of the New York Infirmary (H. S. Oppenheimer) in regard to his then present con-

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[1] Przeglad Ckarski, No. 13, 1877.   Allg. Med. Central-Zeitung, No 65 1877.
[2] Oral communication.

dition. This letter reads as follows: "The patient whom you saw tracheotomized last Monday is sitting up since yesterday. His appetite is better than it was before the operation, according to his own statement, and the dysphagia less. Dr. Asch finds, on examination to-day, less swelling of the ventricular bands, some diminution of the œdema in the ary-epiglottic folds, absence of the slight erosions which existed in the folds and improvement of the ulcerations of the true vocal cords."

The subject of this paper is in part *new*, but none the less important and interesting to the general practitioner and to the specialist. Tracheotomy as an *operation of necessity*, or *dernier ressort*, is perfectly familiar to all practitioners.

But tracheotomy as a *prophylactic*, or as a *remedial* operation, at an early period of a chronic disease of the larynx, hitherto believed to be incurable in the great majority of instances, is a very different operation, looked at in regard to its *indications*, and its *possible*, or *probable* results. As such, I believe, it merits attention. Ere long I trust that other and well-observed histories may be published, which shall corroborate the facts I have here brought forward. Personally, I have the conviction, that within a brief period from this present, tracheotomy will frequently be performed as a trustworthy *remedial* operation in ulcerative phthisical laryngitis. I believe this: 1st. Because I believe that ulcerative phthisical laryngitis is usually *non*-tubercular in its nature, and therefore *curable*. 2d. Because tracheotomy seems to me the best, if not the sole means, of directly attaining this end.

Meanwhile, and without prejudging final conclusions, I respectfully offer the following :—

1. Ulcerative phthisical laryngitis is rarely a tubercular disease.

2. Topical medication, methodically and carefully carried out, is extremely serviceable, if not always curative.

3. Tracheotomy is certainly a palliative procedure of much value, and ultimately may be found a direct curative means yielding very favourable results.

4. To obtain these latter, it seems indicated not to delay the operation to a late date, but rather to perform it so soon as the nature of the disease is obvious, and other measures appear of no avail.

Article VIII.

Cases Treated by the Antiseptic Method at St. Mary's Hospital, Philadelphia. By J. H. Ewing, M.D., Resident Surgeon.

Through the courtesy of the attending surgeons, Drs. Keen, Grove, and Mears, who have kindly allowed the use of the material, I report a

number of cases treated by the antiseptic method, followed by remarks on the results obtained and the value of some experiments made as to minor details of dressing. The treatment was first used during the attendance of Dr. W. W. Keen, in January, 1878, and has been continued ever since in almost every case to which it was applicable. All these cases were dressed with every particular of Lister's method, including of course the spray.

Case I. *Anchylosis of Ankle with Talipes Equinus; Anchylosis broken up by Chisel, and severe injury to Soft Parts; Insufficient Drainage causing Temporary Fever on Eighth Day; Recovery with Useful Limb.*—Hugh G., aged 18 years, admitted Nov. 15, 1877; service of Dr. Keen. Nine years ago he received an injury which resulted in bony anchylosis of left ankle-joint (talipes equinus), and a chronic ulcer of calf of same leg. When first seen his general health was good. January 20, 1878, tendo-Achillis divided subcutaneously, but position of foot was not improved.

Jan. 26. The following operation was performed to place the foot in a favourable position for walking without crutches. The patient under the influence of ether, two oblique incisions were made at the angles of junction of the horizontal and vertical surfaces of the astragalus, and a chisel three-quarters of an inch broad was inserted in four places, between the malleoli and the outer surfaces of the astragalus, and between the horizontal articular surface of the tibia and upper surface of the astragalus, severing almost completely the astragalus from the tibia and fibula; and the bony adhesions were then broken up. A long cicatrix, extending from the inner malleolus to the ball of the great toe, was divided in its whole length to loosen it from the tissues beneath, and the tendo-Achillis and the plantar fascia were divided, the latter in two places. Force was then applied to place the foot at a right angle, but all the force used could not place it at an exact right angle, but say at an angle of 110°. Two drainage-tubes were placed in the incisions. The antiseptic dressing was then applied, and the leg and foot placed on a posterior rectangular splint reaching to the sole. The patient was placed on a light diet.

27*th.* Slept poorly, has no appetite, and suffers a little pain. The part was dressed, and a few drops of bloody discharge came from the drainage-tubes, but no pus. Morning temp. 100°, pulse 120; evening temp. 101°, pulse 120.

28*th.* Slept well, appetite good, and no pain. The dressing was changed because of a serous discharge which had reached the edge of the dressing; no pus. Morning temp. 99°, pulse 100; evening temp. 100°, pulse 100.

30*th.* The drainage-tubes were removed. Temp. normal since the 28th.

Feb. 3. Up to this time the patient has done admirably, not a drop of pus appearing on the dressing, but to-day a sudden rise of temperature was observed, for which no cause could be found. Morning temp. 101°, pulse 100; evening temp. 103°, pulse 120. He was also restless, and did not sleep.

4*th.* In consequence of the continued rise of temperature another careful examination was made, some bagging found where the long cicatrix had been divided, an opening was made and a drainage-tube inserted; a

few drops of serous discharge came from the opening. Morning temp. 101°, pulse 160; evening temp. 100°, pulse 110.

5th. Morning temp. 101°, pulse 110; evening temp. 101° pulse 110.

6th. Morning temp. 101°, pulse 120; evening temp. 102⅗°, pulse 120. Did not sleep well, and appetite is lost. Bagging was found above the heel, evidently from the chisel cut eleven days before. A counter-opening was made by the side of the tendo-Achillis, letting out some bloody serum without smell, and a drainage-tube was inserted.

7th. Slept well, and appetite improving. No pus came from the opening above the heel, but a few drops from the opening in the cicatrix. Temp. normal.

9th. Temp. normal, and he is improving rapidly. Ulcer dressed antiseptically.

15th. Drainage-tubes removed; has had no more fever, appetite good, and sleeps well. The discharge for each day has not been more than ℥ss, and non-purulent. Dressings have been changed each day; ulcer, which was nearly as large as the hand, has not much improved, but the amount of pus has diminished.

26th. The parts have all healed except the opening above the heel, which discharges about ℥ss of healthy pus during the twenty-four hours.

May 4. The wounds in the foot are well, and the antiseptic dressing was discontinued. The ulcer has not improved very rapidly under the antiseptic treatment, and it was also discontinued, and the part strapped with adhesive plaster.

11th. The patient discharged with a useful limb. The foot was near a right angle, and there was slight motion in the ankle-joint. Ulcer all healed except a healthy granulating surface as large as a silver dollar.

Case II. *Large Abscess of Neck; Incision; Recovery without further Suppuration, and without Fever.*—Sarah K., aged 35, admitted Febuary 4, 1878; service of Dr. Keen. Mother died of phthisis and brother scrofulous. Has never had good health, and when four years old had a sore on the leg for seven years; has also constitutional syphilis. Eleven months ago began to suffer from sore throat, and a swelling appeared at angle of left jaw. On admission was very weak; could not open mouth; was fed with liquid food, and an abscess nearly as large as the fist occupied left side of neck.

6th. Under influence of ether an incision two inches long was made and ℥iv of pus evacuated, and a drainage-tube inserted.

7th. Temp. normal; slept well; dressing changed, and a few drops of pus found—a remnant of the abscess.

9th. Temp. normal; dressing changed, and a few drops of pus found.

11th. Dressing changed, no pus.

13th. Dressing changed; temp. normal; drainage-tube removed; wound nearly united.

17th. Discharged well.

Case III. *Fibroma of Testicle; Removal; Union by First Intention, without Fever.*—Charles K., aged 32, admitted February 22, 1878; service of Dr. Keen. States that four years ago, after lifting a heavy stone, left testicle began to swell. On admission it was larger than the fist, firm and hard, without pain or fluctuation, though it was quite elastic.

Feb. 25. Under ether an elliptical incision four inches in length was made, and testicle removed. The individual vessels of cord were tied, six catgut ligatures used, and part united by five sutures, a bundle of

horse hair having been inserted for drainage ; antiseptic dressing was then applied.

26th. A few drops of bloody serum on dressing. Temp. continues normal.

28th. Dressing changed. Temp. normal.

March 2. Parts healed by first intention, and dressing abandoned for carbolized lard. A swelling about an inch in diameter is noticed at external abdominal ring, at end of the spermatic cord. Temperature normal.

7th. Flaxseed poultices applied to swelling.

18th. Swelling has subsided; poultices abandoned.

21st. Dischaged well.

C a s e IV. *Coxalgia; Resection; Highest Subsequent Temperature* $99\frac{1}{5}°$; *Healing by First Intention, with very slight Suppuration around Drainage Tube.*—James F., aged 13, admitted February 21, 1878. Service of Dr. Keen. General health always good until September, 1877, when he had an attack of pleurisy. While convalescing he began to have pain and tenderness in the right hip, the pain shooting down back of leg to knee. Was put to bed and treated for rheumatism. Has a family history of scrofula.

When admitted was extremely pale and cachectic, suffering much pain ; had no appetite, and could not sleep. It seemed scarcely probable that he would live more than a few days, he was so weak. The whole hip was enlarged, hard, and tender ; leg flexed on thigh, thigh on pelvis, and pelvis tipped forwards. Could not lie on back, because of pain which pressure on gluteal region gave. Anteriorly, a short distance from anterior spine of ilium, was a small, red, fluctuating spot, which opened spontaneously in about three days, and a small quantity of watery pus was discharged. Leg could not be moved without considerable pain.

No operation was possible in his existing state of health, and the only object was to build him up. Ordered cod-liver oil, iron, and quinia, and poultices applied to hip. Under this treatment he improved, but was not in a condition for operation until June. At that time his general condition had much improved, appetite good, and he suffered very little pain unless the leg was moved, but was not able to be out of bed. There were now four sinuses communicating with joint. Crepitation in hip-joint.

June 7. Service of Dr. Grove. Under ether a curved incision, reaching to the bone, was made, commencing a short distance above the great trochanter, curving backwards and downwards about three and one-half inches. After division of capsule the headless end of bone was protruded through the opening, and sawn off just below lesser trochanter. Head of bone was found lying loose in acetabulum, and was rolled out like a billiard ball; ligamentum teres entirely destroyed ; head of the bone denuded of its cartilage, and eroded ; neck and trochanters softened and carious. About three inches of bone were removed; acetabulum was slightly diseased on its anterior part, which was scraped, and all the diseased bone removed. Wound was washed out with the $2\frac{1}{2}$ per cent. solution, a drainage-tube inserted, and edges drawn together with iron-wire sutures. A small carbolized sponge was placed over drainage-tube to catch the expected abundant serous discharge of first twenty-four hours, and antiseptic dressing applied over this. He was placed in an apparatus composed of two side-splints extending from each axilla to about twelve inches below the foot, and there connected together by a cross-board. The splints were well padded and bound to legs and body, and extension made

from the cross-board by adhesive plaster on both legs; right leg was pulled down until it was about half an inch shorter than left. Suffered much from shock and pain, and required strong stimulation, and morphia, gr. $\frac{1}{4}$, hypodermically. For night, whiskey, ʒss, every two hours in milk.

8th. Slept well, but very weak; whiskey continued every two hours, with milk and beef-tea; morphiæ sulph., gr. $\frac{1}{4}$, morning and evening, hypodermically. Dressing saturated this morning with bloody serum, and was changed. Morning temp. $99\frac{1}{5}°$, pulse 100; evening temp. $99\frac{1}{5}°$, pulse 100.

9th. Slept well; suffered very little pain; is still very weak. Stimulants continued. Morning temp. 98°, pulse 100; evening temp. $99\frac{1}{5}°$, pulse 105.

10th. Condition much improved, stronger, and more cheerful; whiskey diminished to ʒiv for the twenty-four hours. Dressing changed, and parts look well. Morning temp. $97\frac{3}{4}°$, pulse 105; evening temp. 98°, pulse 100.

11th. Improved in strength. Morning temp. $97\frac{1}{2}°$, pulse 105; evening temp. $97\frac{1}{2}°$, pulse 100.

12th. For first time a few drops of pus were discharged. Morning temp. $99\frac{1}{5}°$; evening temp. 99°, pulse 100. Ordered pyrophosphate of iron, gr. iiss three times a day.

18th. Up to date temp. has been normal. Sutures were removed, and wound found to have united by first intention, except where drainage-tube was, and it was also removed. Wound has been dressed every second day, and about one drachm of healthy pus discharged during the twenty-four hours.

July 1. General health very much improved. Wound dressed every third day since last date, and whiskey reduced to a tablespoonful three times a day; the same diet continued.

10th. Splints removed; wound healed, except where the drainage-tube had been.

20th. The dressing continued. A small opening still remained, which discharged a small quantity of pus.

Aug. 1. He walked about the wards by supporting himself by the side, and is on general house diet.

Sept. 15. He walks very well with a cane; general health very good. Two small openings remained in line of incision, at bottom of which a small fragment of dead bone could be felt. Limb shortened three inches.

Nov. 25. One small fragment of bone discharged; another can be felt, and will be discharged soon. He walks without crutches, bearing his entire weight on leg, limping somewhat on account of shortening, which will be corrected by a thickened sole.

C a s e V. *Coxalgia; Resection; Highest Temperature* $99\frac{1}{2}°$, *except Ephemeral Fever on 3d to 4th day; Union by First Intention, with very slight Suppuration around Drainage-tube.*—Michael F., aged six years; admitted February 6, 1878. Service of Dr. Keen. Two years ago he began to have pain in the right knee, and a slight limp when he walked. About three months ago there was first noticed a swelling in right thigh, which increased slowly, and was not very painful. General health not much affected. When admitted his general appearance was fair, appetite good, and he slept well. A large swelling involved the upper two-thirds of right thigh, and was tense and fluctuating. Right thigh measured in circumference $14\frac{1}{2}$ inches, left $9\frac{1}{2}$ inches; pelvis tipped forwards.

7th. Swelling opened, two incisions being made, one on outer, and other on inner aspect of thigh, and about sixteen ounces of pus discharged, and a drainage-tube inserted. Part was dressed antiseptically, no constitutional disturbance followed, and his general health improved. Dressing continued until March 1, when poultices were applied. Openings discharged a small quantity of pus, and hip was enlarged and somewhat hard.

June 10. Service of Dr. Grove. To this date poultices have been used. The two incisions made Feb. 7 not closed, but discharge a small quantity of watery pus. Hip enlarged and hard. General health improved under the use of cod-liver oil and iron. Leg could be moved backwards and forwards without much if any pain, but, when abducted, there were pain and considerable stiffness and crepitation was felt in hip-joint. The sinuses could not be traced into the joint. Under ether an operation, the same as for Case No. IV., was performed. Head of femur was found carious; lower half completely denuded of cartilage; upper half covered by cartilage, which was roughened, and barely attached to neck at epiphysis. Neck and trochanters carious; the bone was sawn off below lesser trochanter; about two and a half inches of bone removed. Acetabulum not diseased. Two drainage-tubes were inserted; wound closed by iron-wire sutures, and antiseptic dressing applied. He suffered very little from shock after operation, but had a good deal of pain, for which morph. sulph. gr. $\frac{1}{4}$, was given hypodermically. Temp. normal.

11th. Rested well during the night, and suffered now very little pain. Ordered milk and beef-tea, and whiskey ℥ss every four hours. Dressing was changed, and part looked well. Morning temp. $98\frac{3}{4}°$; evening temp. $99\frac{1}{2}°$. Prescribed quiniæ sulphat. gr. j every two hours.

12th. Morning temp. 99°, evening temp. $99\frac{1}{2}°$.

13th. When dressing was removed a slight blush was noticed about incision, and a few drops of pus were found on dressing. Had very little pain, and took nourishment well. Morning temp. 100°, evening temp. 103°.

14th. Morning temp. $99\frac{1}{2}°$, evening temp. 101°.

15th. All redness has disappeared, and about one drachm of healthy pus discharged. Morning temp. $98\frac{3}{4}°$, evening temp. $99\frac{1}{2}°$.

17th. Drainage-tube removed, and about two drachms of healthy pus discharged during twenty-four hours. Temp. to date has not been above normal; general health much improved.

20th. Sutures removed, and wound united by first intention, except where drainage-tube had been.

July 1. Pus, since the 17th, not sufficient to saturate the dressings for three days. Temp. normal.

10th. Splints removed.

20th. Antiseptic dressing discontinued. A small amount of pus is still discharging from the one opening.

25th. Could walk about the wards with a cane.

Sept. 15. Motion of leg good, and can bear his weight on the leg. General health very much improved. There was a sinus in line of first incision, at bottom of which a fragment of dead bone could be felt. He was taken to his home.

CASE VI. *Compound Comminuted Fracture of the Ulna; Insufficient Antiseptic Precautions and Drainage at Outset; Fever abating on reme-dying Errors; Recovering with slight Suppuration for so severe an*

Injury, and without Necrosis.—Harry A., aged 18, admitted February 11, 1878. Service of Dr. Keen. Suffering from a compound comminuted fracture of right ulna, caused by a circular saw. Upper fragment of ulna projected a rough, ragged edge from wound, and soft parts were very much lacerated for three-quarters of the forearm; bleeding was slight, and no vessels were tied. All pieces of bone were removed, and the wound carefully washed with $2\frac{1}{2}$ per cent. solution of carbolic acid, and parts approximated with catgut sutures; no drainage tube was used. Antiseptic dressing applied, and arm supported with an internal angular splint and a straight splint for outer surface of forearm.

12th. Did not sleep well, but did not suffer much pain. A few drops of pus discharged. Temp. 101°.

13th. Temp. 103° in the evening, and he was very restless.

14th. First seen by Dr. Keen. Bad odor from wound, and about a tablespoonful of pus discharged. One suture removed, and the part washed with solution of chloride of zinc (gr. xl–$\text{\small{3}}$j), and a drainage-tube inserted; slight blush above wound, reaching to the elbow-joint. Temp. 101°.

17th. Since last date temperature has been normal; sutures gave way, and the parts separated, exposing the bone. Drainage-tube was removed as drainage was now free. About a tablespoonful of healthy pus discharged during twenty-four hours; no odor about wound; redness disappeared, and wound looked perfectly healthy.

20th. Wound was granulating, and bone almost covered; no pain; appetite good, and slept well. Amount of pus very much diminished; dressing was continued until March 6th, when wound had almost closed, a small granulating surface remaining.

March 13. Discharged with good motion in fingers and elbow-joint. No necrosis ever occurred.

Case VII. *Compound Fracture of Frontal Bone; Bone denuded and not healing under ordinary Treatment; Rapid Healing without Necrosis under Antiseptic Dressings.*—Isabella L., admitted September 25, 1878. Service of Dr. Mears. Suffering from fracture of frontal bone, caused by blow on head with a pitcher. An incised wound was found about $1\frac{1}{2}$ inch in length in left frontal region, just anterior to coronal suture; at bottom of which could be felt a fracture of bone, lines of fracture radiating in various directions; no depression of bone and no symptoms of compression of brain. Wound was closed with iron-wire sutures, and cold-water dressing applied. Did well until fourth day, when parts about wound became red and swollen; redness and swelling extending to the level of ear; sutures were removed, and a small quantity of watery pus discharged; and at bottom of wound the bone could be seen completely denuded of its periosteum, about 1 by $1\frac{1}{2}$ inches, being in this condition. Temp. was 101°. In about three days all redness and swelling disappeared, and temp. was normal.

Oct. 10. Service of Dr. Keen. Bone still further denuded, and wound shows no tendency to healthy granulation. The part was washed out with 5 per cent. solution and antiseptic dressing applied.

16th. Granulations have covered half-denuded bone, and only a few drops of healthy pus discharged.

20th. Granulations completely filled the wound, and cicatrization commenced.

23d. Dressing continued.

Nov. 1. Discharged. Wound nearly all healed.

Case VIII. *Scirrhus of Breast; Amputation; Temperature under* 100°; *Return of Disease; Reamputation three months after First; Temperature as a rule not over* 100°; *Slight Suppuration; Final Return of Disease.*—Bridget Q., aged 51, admitted April 29, 1878. Service of Dr. Grove. When first seen she was rather pale; general health was good. A tumour about size of fist occupied left mammary gland, projecting about half an inch above the healthy tissue; it was hard and red, almost purplish, and veins of breast and surrounding tissue enlarged; and was the seat of occasional sharp shooting pains. There was no glandular involvement.

May 2. Two curved incisions were made, and whole breast removed, including unhealthy skin covering the tumour. Four vessels were tied by carbolized catgut. The parts were approximated by silver-wire sutures, two drainage-tubes were inserted, and antiseptic dressing applied. Suffered very little from shock, but required morphia gr. $\frac{1}{4}$ hypodermically for pain. Ordered milk and beef-tea.

3*d.* Slept well, and had no pain, but feeling of soreness in part; dressings saturated with the bloody oozing, and were changed. Temp. 99°.

8*th.* To date has been dressed every day. About two teaspoonfuls of discharge during the day. The temp. has not reached 100°.

10*th.* Slight inflammation of surface above the incision, which reached to clavicle; this was painted with tincture iodine, and antiseptic dressing continued; about same amount of discharge as at last date. She felt a little restless, and quiniæ sulphat. grs. ij, was given every two hours.

12*th.* All redness disappeared; slept well, and has no pain; sutures removed, and the wound united by first intention, except about three-quarters of an inch in the centre of the wound. Temp. 99°.

21*st.* Wound dressed every third day. It has all healed, except a small granulating surface as large as a quarter dollar. General health much improved. To date temperature has been normal.

June 1. Antiseptic dressing discontinued.

12*th.* Discharged. A small granulating surface remained as large as ball of thumb, which looked perfectly healthy, but was indolent. Diagnosis, cystic sarcoma.

Aug. 13. Readmitted. Service of Dr. Mears. The open surface remained the same for about three weeks, when it began to pain, and in a few days the edges became hard and began to grow, filling up the opening, and were soon above the surface of skin. When readmitted, there was a fungous mass, as large as the fist, and parts around were hard, red, and painful. The growth was the seat of sharp, shooting pains, frequent hemorrhage, and gave off the most offensive odor and sanious, irritating pus; no glands were found enlarged, appearance very cachectic, appetite poor; could not sleep well, and was rapidly being worn out by constant discharge and pain.

25*th.* Two incisions were made, including the whole of the diseased structure; pectoralis major, just beneath tumour, was found diseased, and this part was also removed; the removal of the tumour left an open space to ribs, extending from sternum to axilla, and about four inches wide. Six vessels were tied, and the wound drawn together as well as possible by carbolized silk sutures, but left a space almost as large as the hand. A large antiseptic dressing was applied. She suffered much from shock, and required strong stimulation. Whiskey ʒss every two hours, milk, and beef-tea were ordered.

26th. Dressing changed, and parts looked well.   Temp. 100°.   Quiniæ sulphat. grs. ij, every two hours, ordered.

31st. Surface granulating, and commencing to cicatrize ; sutures removed, and wound gaped a little. The temp. has ranged from 99° to 101°, but, as a rule, not above 100°.   Improving in strength and appetite.

Sept. 9. To date the dressing changed every day, and the temperature has been normal.   About a tablespoonful of healthy pus discharged daily. Granulations have filled the wound completely, and cicatrization is going on rapidly.

15th. A granulating surface remains as large as the palm of the hand.

Oct. 5. Dressing discontinued ; the surface was as large as half the palm of the hand.

19th. Service of Dr. Keen.   Two suspicious looking buds of granulations were removed.   The parts looked well for about two weeks, when again their soft fungous masses began to appear and were again removed, and in lower and outer part a mass of diseased tissue, about size of a walnut, was found beneath the skin (which was not diseased), and this was also removed.

22d. The disease has commenced to return again, and, as the case was considered hopeless, she was removed to her home.

Case IX. *Scirrhus of both Breasts ; Consecutive Amputations seven weeks apart ; Two Modes of applying deep Supporting Sutures or Guys ; After First Amputation Hemorrhage and Decomposition of Clots, but no Fever ; After Second, Fever by Error of Dressing.*—Ann S., aged 42 ; admitted September 28, 1878 ; service of Dr. Mears.   About two years ago she first noticed a small lump, about the size of a hickory nut, behind the right nipple, which continued to grow larger, but was not painful, except on pressure, until six months ago, when it ulcerated, discharging foul sanious pus of an offensive odour, and became the seat of short, shooting pains.   A short time after the tumour in the breast was noticed a smaller one was felt in anterior part of axillary space, on border of great pectoral muscle.   The general appearance cachectic, but had good appetite and slept well.   The whole right breast hard, somewhat nodular, and presented an eaten appearance and discharged offensive, ichorous pus. At anterior part of axilla was a lump as large as a walnut.

Oct. 1. Two curved incisions were made, including all the diseased structure, and whole gland removed.   Enlarged gland in axilla dissected out.   Bleeding quite profuse ; seven vessels were tied and wound drawn together in this way: a needle armed with a silk thread was passed through tissues about $\frac{3}{4}$ inch from edge of wound, from without inwards, and then carried to other edge and passed through from within outwards, about same distance from edge of wound ; a harelip pin was then passed through the skin where the needle had entered and also where it emerged, and the thread was drawn up tightly and wound around these pins ; then outside a thread was wound between the pins.   By this means the wound could be drawn together, leaving not more than three inches which were not covered by skin.   Drainage-tube placed in axilla and antiseptic dressing applied.   In about an hour after dressing was applied the part was found bleeding, but this was controlled without much difficulty by pressure.   Reacted well from operation, but felt weak from loss of blood.   Stimulants were given, and as she was very restless, gr. $\frac{1}{4}$ of morphia was given hypodermically.

2d. The dressings saturated with blood and surface of the wound covered

with clotted blood, of which only that which could readily be washed away was removed.   Temp. normal.

4th. To date temp. normal and the part dressed each day.   Slept well and had good appetite.   There was a disagreeable odour about the part, the blood-clots evidently having taken on putrefaction.   Temp. $99\frac{1}{2}°$. The part was carefully washed with the 5 per cent. solution.

6th. All odour disappeared from part; surface granulating and commencing to cicatrize.   Pus discharged was about ℥ij for twenty-four hours. Temp. normal.

8th. Sutures and pins removed; wound did not gape; drainage-tube also removed.

19th. Dressing not changed for four days, and no odour whatever observed; part is healing rapidly.

26th. The amount of pus has not been sufficient to reach the edge of dressing for a week; no odour; a perfectly healthy granulating wound remained as large as a half dollar.

Nov. 1. Antiseptic dressing discontinued; small surface remains which has not healed, but is healthy looking.

22d. Service of Dr. Keen.   A few days after operation of October 1st a few small hard nodules were felt in left breast; these were painful on pressure, but gave no other inconvenience.   About a week ago the breast was again carefully examined and a hard lump was felt behind nipple deep in breast.   The open surface remaining from the other operation was very small.   It was thought best to remove the breast.   Two incisions were made, including the skin containing the nodules and the nipple, and the whole breast removed.   Three vessels were tied.   Wound drawn together in this way: a needle armed with silver wire was passed through the tissues about one inch from edge of wound, and passed out on other side about same distance from edge of opening.   Upon each end was slipped a bead of glass $\frac{5}{6}$ of an inch in diameter; the beads were brought down to the skin, and each end of the wire wound around a piece of match, drawing upon the wire to make it tight.   Two of these deep sutures were used, and the edges of wound were then approximated with iron-wire sutures.   A drainage tube was placed in wound extending whole length of incision; salicylic cotton was placed over end of the drainage tube and antiseptic gauze applied.   Reacted well.   Morphia gr. $\frac{1}{4}$, hypodermically given. Temp. $99°$.

23d. Did not sleep well and did not care for nourishment.   Dressing changed and considerable bloody serum came from the drainage-tube.   A. M., temp. $101\frac{3}{5}°$.   P. M., temp. $102\frac{2}{5}°$.   Suffered considerable pain all day.

24th. Still restless, but slept some during the night.   A few drops of pus were found on the dressing.   A. M., temp. $100.5°$.   P. M., temp. $98°$.

25th. Temp. $99\frac{4}{5}°$.   Appetite good.

26th. Guys removed and about $\frac{1}{2}$ inch of the drainage-tube removed. P. M., temp. $100\frac{3}{5}°$.

28th. About ℥ss of pus pressed from wound.   A M., temp. $101.5°$. P. M., temp. $101\frac{2}{5}°$.   It was found that by accident ordinary cotton had been placed over drainage-tube in place of antiseptic cotton, at least once and perhaps oftener.

29th. A. M., temp. $100.5°$.   P. M., temp. $100°$.   Sutures all removed and about 1 inch of wound found not united.

Dec. 5. To date temp. normal.   The parts dressed every second and

third day and the discharge of healthy pus very small. Appetite good, sleeps well, and general health improved. Several glands in right axilla were to-day found enlarged, and one in left.

15th. Dressing continued to date, when the part was all healed. The open surface of right side remaining from the last operation became larger, but is now healing under use of a solution of tartrate of iron and potassa.

CASE X. *Necrosis of Sternum and First Rib: Resection; Temporary Fever: Union by First Intention without Suppuration.*—Jacob S., aged 66; admitted October 28, 1878; service of Dr. Keen. About eight months ago he first noticed a swelling over upper part of sternum, about level of first rib; this increased slowly, became red and fluctuating, and in about three months opened spontaneously and discharged a small quantity of pus. When admitted there were three sinuses, one above clavicle and two over upper part of sternum, which discharged a small quantity of pus. Probing these, dead bone could be felt. The parts around were hard, enlarged, and red, but not very painful.

Nov. 2. An ⊥ incision was made from left sterno-clavicular articulation to second interspace, exposing freely the diseased bone. About $\frac{3}{4}$ inch of first rib was found diseased, and a portion of sternum as large as a silver dollar, and was removed piecemeal by the double-gouge forceps. Wound washed out with $2\frac{1}{2}$ per cent. solution of carbolic acid, a drainage tube inserted, and parts closed by iron-wire sutures. The gauze prepared with thymol applied. Suffered some pain after operation, and was given morphia gr. $\frac{1}{4}$ by mouth. Temp. normal.

3d. Slept well and has no pain; dressings saturated with bloody serum and were changed. Temp. $101\frac{1}{2}°$.

4th. Slept well; no pain; dressing changed. Temp. reached 102°.

5th. Did not sleep very well; dressing changed, but no pus found; parts look well. Temp. $100\frac{3}{5}°$.

6th. Sutures removed and the parts united by first intention, except where the drainage-tube was placed. Temp. normal.

8th. To date temp. normal. Drainage-tube removed; a few drops of pus.

14th. To date parts dressed every second day, and temp. normal. The redness and enlargement have all disappeared; the dressing discontinued. One large sinus remains where the drainage-tube had been, and discharges a small quantity of pus. This was packed with lint.

28th. Sinus remains, but is rapidly becoming smaller by filling up from bottom; general health very much improved. In this case the gauze was prepared with the thymol, but the carbolic acid solutions were used for washing and for the spray.

REMARKS. I. *Dressing.* (a) *Gauze.*—The gauze used is prepared in the hospital, and is much softer and can be more easily adapted to any irregularity of the part than any purchased, except the imported article; being softer, it absorbs the discharge before it can reach the edge of the dressing, as it is very apt to do if the gauze is very stiff by passing between the skin and the dressing. It is prepared in this way: For fifty yards of the gauze take paraffine, ʒv; resin, ʒivss; carbolic acid, ʒjss; and about ʒij of alcohol, and mix them by heat. Six drachms of carbolic acid are added to two gallons of water and the mixture brought to a boiling point. The whole of the gauze is first passed through the watery solu-

tion of carbolic acid, and then through the first mixture which is boiling, and immediately after it through a clothes wringer; it is then placed on a line to dry, and when dry sprinkled with a solution of carbolic acid (℥ss to Oij), smoothed out with the hands and folded into the eight layers, and is then ready for use.   Prepared in this way it costs $4\frac{1}{5}$ cents per yard without the labour.

(b) *Protective.*—The protective is also prepared in the house from oiled silk in the ordinary way,[1] and is of the same colour as the oiled silk, not green as is the imported article.   Its lighter colour gives it an advantage over the imported, for the change of colour to black which the smallest amount of septic material in the part causes can more easily be seen.

(c) *Bandages.*—The bandages are the ordinary muslin roller, and not prepared with carbolic acid as directed by Prof Lister.

(d) *Drainage.*—Both the rubber tubing and the horse hair have been tried for drainage, and the horse hair found particularly serviceable, as it allows of closer approximation of the parts, a perfect drainage, and as the discharge diminishes the hair can be removed, a few strands at each dressing until the part has healed; but when the discharge may be expected to be large, the rubber tubing answers a better purpose.   The importance of free drainage is seen in Case I.; a drainage-tube should have been passed antero-posteriorly from the incisions through the leg immediately after the operation, and the neglect to do this will account for the increase of temperature on the eighth day, which immediately became normal after free drainage was established.   The fact too that eleven days after the operation this pent-up discharge was bloody serum and not pus is most noticeable.

(e) *Time.*—The trouble and time required in the use of this method may be deemed by some an objection, but when we consider the fact that, after the first few days at most, the dressing remains two or three days, and sometimes even a week without being removed; we have found that while the time occupied for any one dressing is slightly more, it is in the sum total less than with the ordinary treatment; and the advantage of the dressing's not being removed for a number of days is not only in the time and trouble saved, but the freedom of the patient from the pain and annoyance of frequent dressing and the perfect rest allowed the part.

(f) *Atomizer.*—The spray apparatus first used was the ordinary throat atomizer which answered the purpose admirably, and for all operations that do not require too long a time, or extend over too great a surface, this will do as well as the more expensive ones.   It is easily prepared by replacing the shield-stand and medicine cup, by a ℥iv bottle, and using a large atomizing tube with a rubber tube attached to reach to the bottom of the bottle.   The spray apparatus now in use is that of Dr. R. F. Weir, of

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[1] First coated with copal varnish on each side, and then with a mixture of dextrine 1 part, starch 2 parts, and of a 5 per cent. solution of carbolic acid and water, 16 parts.

New York, and costs fifteen dollars; it throws a large spray and is very convenient and durable.

We have tried the apparatus of Dr. Heuel for conducting the spray away from the rest of the apparatus by a rubber tube seven feet long, and while we have found it very convenient, as it is light, and the spray can be thrown in any direction, and it does away with all danger of the ether's taking fire from the lamp, yet we have been annoyed by the bursting of the tube conducting the steam. This has now been remedied by having a layer of cloth placed in the tubing as suggested by Dr. Keen.

(g) *Mackintosh.*—In place of the Mackintosh we have tried oiled silk, oiled muslin, gutta-percha tissue, waxed paper, and paraffine paper. The paraffine paper and the waxed paper, worth about one cent a sheet, 36 by 24 inches, will not answer well, as they are permeated by the discharges. The oiled silk at $1.50 per yard meets every indication. The oiled muslin at 75 cents per yard is also a very good substitute, but is a little stiff if the surface is uneven. The gutta-percha tissue at 60 cents per yard answers every purpose as well as the Mackintosh or oiled silk, while it is much cheaper; its transparency and flexibility are advantages as the condition of the dressing can be seen through it, and it can be fitted easily to any part. Dr. Keen has lately suggested that paraffine paper can be prepared with rubber to avoid both absorption of discharge and to increase the impermeability and the toughness of the paper. But our experience with it is as yet too limited to pronounce an opinion.

(h) *Errors.*—We have made several, and have frankly stated them. Such errors were due chiefly to inexperience in the details of a new dressing requiring care. Probably the slight suppuration occurring in several of the cases was due to errors from the same cause; but granting that it was, it was incomparably less than generally follows in similar cases, and in most of them was simply a few drops.

II. *Results.*—The absence of fever has been marked. Most of the cases reported were severe operations, yet the fever was usually ephemeral, and not at all of the severe grade of more or less prolonged surgical fever so commonly seen in such cases. Of course without the antiseptic precautions many cases recover without much fever, but the *rule* is that they *do* so suffer. In our present experience with antiseptic precautions the rule is that they do *not* for any length of time. There has been but one case of erysipelas in the wards since the method was introduced, and in this case (a severe scalp wound) the erysipelas appeared before the antiseptic dressing was applied, and advanced Bright's disease soon destroyed life by coma and convulsions. The perfect cleanliness, as everything used is washed carefully with carbolic acid, may have much to do with the absence of erysipelas, fever, and other complications, yet can scarcely account for all the good results obtained. No cases of pyæmia except the following supposed case has occurred. This at the time was thought to be a failure of

Listerism, but it was afterwards discovered that there had been a mistake in the solutions ; in place of the strong solution (gr. xxiv to ℥j), gr. vj, and for the weak (gr. xij to ℥j), gr. iij had been used.

CASE XI. *Strumous Abscess ; Error in Dressing ; Death possibly from Pyæmia.*—Pat. K., aged 33, was admitted May 28, 1878, service of Dr. Grove, suffering from a strumous abscess of right gluteal region, of seven months' duration.   The abscess extended from first lumbar vertebra to a short distance below great trochanter, and from anterior spine of ilium to within an inch of the anus.   Aspiration was tried, but the pus would not flow, as it contained masses of broken-down lymph which immediately stopped up the tube.

Jan. 14. A free opening was made by side of lumbar vertebræ, and more than a quart of pus, containing great masses of cheesy dead tissue, was discharged ; no constitutional disturbance whatever until midnight of 15th, when he was taken with rigor and vomiting.

16*th.* Cold, almost pulseless, covered with cold perspiration, and rapidly sinking.   He vomited almost constantly, had great thirst and pain in abscess. That decomposition had taken place in the sac, could be seen from the fact that it contained gases, which gave a crackling sound when the part was pressed upon, and could be pressed from the opening in bubbles.   The pulse was thin and sanious.   Notwithstanding stimulation by mouth and rectum with whiskey and ammonia, and quinia given in large doses, and the sac washed out with the supposed 5 per cent. solution of carbolic acid, and afterwards with the solution of chloride of zinc (gr. xl to ℥j), he continued vomiting until 4 P. M. of the 17th, when he died.   No post-mortem could be made.

We cannot say that Listerism properly carried out would have saved this man's life, nor do we think this can at all be considered a fair trial of the treatment in this class of cases.   No death has occurred in the ward under this treatment, except a case of cholecystotomy which has been reported by Dr. Keen separately (see number of this Journal for January, 1878, page 134), which resulted fatally not from failure of this treatment, but from shock and hemorrhage.

Recovery.—The time before recovery is completed for a given number of cases is shorter as the complications that so often retard recovery, especially in crowded hospital wards, are in a great measure avoided ; and this fact allows of operations, which under ordinary circumstances would not be justifiable.   Case I. was really a bad compound fracture of the ankle-joint with serious and extensive injury to the soft parts, yet the constitutional disturbance was very slight and accounted for by the error of drainage.

Wards.—There has been a marked improvement in the wards since the introduction of this treatment, as the finely divided carbolic acid that is thrown into the air by the atomizer during the dressings thoroughly disinfects them and does away with all odour and makes them neat and clean. For disinfection the atomizer has also been carried through the medical wards, and we have found it to be a convenient and certain method of disinfection.

<div align="center">ARTICLE IX.</div>

COMPLETION OF THE HISTORY OF A SUCCESSFUL CASE OF PARACENTESIS OF THE PERICARDIUM. By WILLIAM PEPPER, A.M., M.D. (Univ. of Penna.), Prof of Clinical Medicine in the University of Pennsylvania.

IN the number of the *Medical News and Library* for March, 1878, I published a clinical lecture on Paracentesis of the Pericardium, which contains the report of a case occurring in the practice of Dr. G. A. Rex, in which I performed this operation. The patient was an apparently healthy girl of 17 years old, who, without known cause, developed pericarditis with extensive effusion. There was alarming disturbance of respiration and circulation, with epileptiform convulsions. The urine was slightly albuminous, and hyaline tube casts were found. On the evening of September 11, 1877, when paracentesis of the pericardium was performed, she was evidently moribund. The puncture was made in the fifth intercostal space, about one inch inside of the line of the left nipple, *i. e.*, nearly in the normal position of the apex-beat, and over eight fluid-ounces of reddish serum were removed. Immediately following the operation, the urgency of the dyspnœa and cardiac embarrassment was relieved. The patient slowly improved, and in the course of a month was able to spend the day out of bed, and to walk about slowly. There was no return of pericardial effusion, and the heart's action steadily improved. Albumen disappeared from the urine, and tube casts could no longer be found. About three and a half months after the operation plastic pleurisy occurred on both sides of the chest, and this was followed by ascites, evidently connected with subacute peritonitis. There was no evidence of any tuberculous affection of the lungs. There was no hereditary diathesis of either a tuberculous or syphilitic character, yet it was evident that there existed a constitutional tendency to slow inflammatory affections of all the serous membranes successively. In that report the history of the case was brought down to February, 1878, at which time it might safely be said that, as far as the original disease and the operation were concerned, the result had been completely successful. But there was still considerable ascites, although it seemed likely to yield to the use of an exclusive milk diet, and full doses of iodide of potassium. Through the kindness of Dr. Rex I am now able to supply the subsequent history of the case from February, 1878, down to December 12, 1878, the date of her death, as well as to give the results of the post-mortem examination.

Under the continued use of iodide of potassium and digitalis, with the occasional use of small doses of bichloride of mercury, the ascites almost entirely disappeared. The appetite was capricious and poor; but there was a gain in strength, so that she was able to be up all day, to walk up and down stairs, and, during the summer, to pay a visit of several weeks to the country. There was no return of cardiac or pulmonary disturbance,

though the pulse remained frequent and small. Albuminuria did not recur, and there was no return of convulsions. The ascites fluctuated, at times increasing, and again diminishing. For some weeks previous to her death it had been considerable. On the evening of her death she had seemed as well as usual, and went up stairs, undressed herself, and lay down in bed, when almost instantly she made several hurried exclamations, had some irregular spasmodic contractions about the face and arms, and died in a few moments.

The *post-mortem* examination was made under some difficulties, so that thorough investigation was not possible. The head was not examined. On opening the abdomen the lower part was found occupied by an extensive effusion. The intestines were floated upwards. There were few if any signs of inflammation of the intestinal peritoneum, but marked changes were observed in the parietal peritoneum and in the capsules of the liver and spleen. The peritonitis was most marked in the upper segment of the abdomen, where the parietal membrane presented large patches of irregular thickening. No tubercles were found on any part of the peritoneum. The capsules of the liver and spleen were greatly thickened, whitish, opaque, and densely fibrous. The liver was enlarged and heavy, and so tightly bound by its thickened capsule that its shape was somewhat altered. On section it was dark coloured, and showed nutmeg congestion.

The spleen was enlarged, congested, and slightly softened. The kidneys were unusually adherent to their surroundings, were slightly enlarged and heavy, and presented slight irregularities in shape, due to shallow curving depressions of their surface. The capsule was very slightly thickened, but could be stripped off without removing any portions of the cortex. The tissue was too dense and hard, and the entire organ was much congested. Microscopical examination showed a slight degree of interstitial nephritis, the capsules of the Malpighian bodies being thickened, and the intertubular connective tissue slightly increased. The stomach and intestines were apparently healthy. The mesenteric glands were not enlarged.

The diaphragm, especially that part of it underlying the pericardial sac, had undergone marked fibroid degeneration. The muscular tissue was much atrophied, many fasciculi had evidently disappeared, while many others were markedly narrowed, some of them shading off to a width of less than $\frac{1}{3000}$th of an inch, and finally disappearing altogether. They retained, however, even in their narrowest dimensions, their transverse striæ.

On opening the thorax the cellular attachments of the sternum all along the anterior mediastinum were unusually close and resisting. The pericardial sac was closely applied to the body of the heart, which occupied its normal position. All around it there was marked thickening and fibroid change in the cellular tissue and adjacent serous membranes.

No trace of the puncture could be found. On cutting through the pericardium the sac was found completely obliterated by close and universal adhesions. The visceral layer was somewhat thickened, and presented numerous small nodular roughnesses. The reflected layer was about onefifth of an inch thick, and composed of dense fibrous tissue. The diaphragmatic portion was particularly thick, and was blended with the altered fibroid structure of the muscle. The heart was of normal size. There was no disease of any of its valves. The walls of the right ventricle were decidedly thinner than natural. The other walls were of average

thickness. Microscopic examination showed marked fatty degeneration, the muscular fasciculi being granular, while their transverse markings had disappeared. There was no ante-mortem clot.

The lungs were extremely congested and œdematous, dark in colour and heavy, although crepitant. There was no tuberculous or caseous formation. The pleural membranes on both sides were thickened and adherent throughout. The thickening was considerable all over, but was especially great over the anterior borders, and the mediastinal surfaces of the lungs. Here the amount of fibroid thickening was so great that, in conjunction with the condensation of the mediastinal cellular tissue, the pericardial thickening, and the transformation of the diaphragm, it caused an accumulation of new-formed fibrous tissue almost like a morbid growth occupying the anterior mediastinum. The microscopic examination of the above specimens was made by Prof. James Tyson.

Remarks.—It is now possible to estimate fairly the effects of the operation of paracentesis of the pericardium in this case. It is evident that the needle entered the lower left angle of the sac, and thus was in the most favorable position for draining its cavity. As far as the operation itself was concerned also, it was clearly a perfect success, since the liquid did not return, and complete obliteration of the pericardial sac occurred. It would appear, therefore, as though life might have been indefinitely prolonged in considerable comfort had it not been for the progressive implication of the various other serous membranes. As it was, life was prolonged fifteen months, after the first of which time little annoyance was experienced from disturbance of the heart's action. It will be noted, however, that while the muscle of the diaphragm had undergone atrophy with fibroid change, evidently from extension of disease from the investing serous membranes, the muscular tissue of the heart had undergone advanced fatty degeneration. It is a well-known fact that this organ presents a peculiar tendency to this change, although the diaphragm not rarely undergoes a similar degeneration. Among the causes of fatty degeneration of the heart adherent pericardium must be included, though it is always a matter of doubt how far the change in the muscular tissue is due to the interference with its nutrition caused by the adhesions, and how far to the influence of a true myocarditis, occurring simultaneously with the pericarditis. In the present case it seems that a large share must be attributed to this latter cause.

It does not often happen that one can be, during life, as sure of the existence of adherent pericardium as in this instance, and therefore it should have been a very favourable chance to study the physical signs which are thought to be diagnostic of this condition. But, in fact, they were entirely absent. The impulse of the heart was diffused and feeble, and unattended with thrill. There was no recession of the intercostal tissues during the ventricular systole, nor any diastolic collapse of the jugular veins, nor recession of the epigastrium. And this was the case, despite the fact that there existed those external adhesions between the pericardium

and the chest walls in front, which seem in some cases to render the above-mentioned signs of pericardial adhesions more evident. This case must be regarded as another illustration of the fact that while, when these signs are present, the existence of adherent pericardium may be assumed with great probability, they may all be absent in cases of complete adhesion.

The condition of the kidneys was very interesting as bearing on the nature of the convulsions which occurred during the stage of acute illness preceding the operation. It will be recalled that for some months previously she had noticed increasing dyspnœa, and had been obliged to pass urine more frequently than usual, which, on September 9, 1877, contained a slight trace of albumen with a few hyaline or granulo-hyaline tube casts. On October 15th, however, thirty-three days after the operation, in which interval the urgent symptoms of disturbance of circulation and respiration had passed away, the urine no longer contained even a trace. It seemed probable that the albuminuria was secondary and dependent on the long-continued and marked disturbance of the action of the heart and lungs. When the latter became intense there was an increase in the renal congestion, and for the time the interference with the secretion of urine caused severe symptoms, and added greatly to the gravity of the condition. Although, after relief was afforded to the circulation by the withdrawal of the pericardial effusion, the albuminuria disappeared, it appears that there remained a certain degree of irritation and congestion of the kidneys which ultimately led to slight hyperplasia of the interstitial connective tissue. In short, the condition of the kidneys was such as is frequently seen in connection with and dependent on organic disease of the heart. It is not possible then to regard the wide-spread, almost universal, affection of the serous membranes as in any way consequent upon chronic kidney disease, nor does it seem possible to determine what was the essential cause and intimate nature of this affection. It was not attended with the formation of either tubercles or cancer. The parents were healthy, the father never having had syphilis. The patient herself presented no evidence of inherited syphilis, and certainly had not acquired the disease. In its insidious development, its essentially chronic, non-febrile course, and in the progressive implication of the various serous membranes, the affection was more closely allied to a degenerative process than to a simple inflammation. There was no history of antecedent acute disease (except an attack of measles in early childhood) ; and the only influence which can be assigned as having part in the production of the disease was her exposure to draughts which blew on her while at work. It would seem that there must have been some constitutional tendency to this type of disease of the serous membranes, which required only the action of ordinary causes to call it into activity. As the liability to such progressive disease could not have been foreseen, the operation was certainly imperatively demanded ; and, as already said, its results were entirely satisfactory, since the effusion was safely

removed, the impending death was averted, and there was no return of
pericardial effusion, and no injurious effects whatever from the operation
itself.

Article X.

UNUNITED FRACTURE OF THE HUMERUS SUCCESSFULLY TREATED BY
DOUBLE SPLICE AND CLAMP. By F. Le Moyne, M.D., Surgeon to the
Western Pennsylvania Hospital. Pittsburgh. Pa.

ALEXANDER F——, 34 years of age, was born in Scotland. He is a
cutter of clothing, has always enjoyed good health, and could furnish no
history of specific disease or constitutional defect. On July 13, 1877,
while riding in a car of the A. V. R. R. with his elbow projecting from
the window, he was struck by a post, causing a simple fracture of the
humerus. He received prompt surgical attention. On the 26th of August,
1877, the arm was dressed with plaster of Paris, which was continued for
several weeks, and followed by silicate of soda and ordinary splints. He
was admitted to the Western Pennsylvania Hospital March 20, 1878, and on
the 27th Brainard's drills were used. On May 15, 1878, three ivory pins
were inserted into the ends of the bone, and on July 10th the fragments
were redrilled. All these measures failed to produce union, and on Oct.
1, 1878, the arm was almost useless, and the man so anxious for relief,
and determined to persevere as long as any hope of success remained,
that I resolved to make another effort. Upon external examination
the fragments seemed partially in apposition, but very movable. The
fracture was found to have occurred near the junction of the middle and
lower thirds. The upper end of the lower fragment could be distinctly
felt, and seemed to be drawn forward by the brachialis anticus and the
flexor muscles of the forearm and hand. On the 23d of October, 1878,
having the patient well anæsthetized, I exposed the fracture by a free
longitudinal incision through the anterior aspect of the arm. No fragments
of ivory, or other traces of former operations, were discovered, except some
induration of the connective and muscular tissues.

Fig. 1.
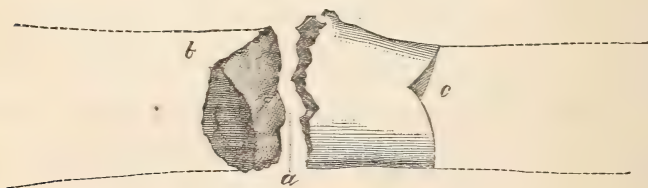
The method of connection was principally fibrous, but an articular sur-
face, Fig. 1, a, about one-fourth of an inch in diameter, existed, having a
synovial membrane. With very little loss of tissue, the upper end of the
lower fragment was formed into a V-shaped groove, running antero-poste-
riorly, and removing a wedge-shaped fragment, Fig. 1, b. The extremity

of the upper fragment being somewhat excavated, a greater loss of bone
was necessitated.   It was first sawn transversely on a level with the most
receding portion of the excavation, making a plain perpendicular section
of the bone.   Then two sections were made, respectively, from the external
and internal aspects of the shaft of the bone, each beginning one-fourth of
an inch from its extremity and terminating at its
centre, removing a V, Fig. 1, c, and leaving a wedge
to fit into the V of the lower fragment.   In anticipa-
tion of the operation, a steel wire clamp, Fig. 2, bent
upon itself at right angles at each end, and a brass
plate, with perforations to correspond with the ends of the clamp, had
been prepared.

Fig. 2.

Fig. 3.
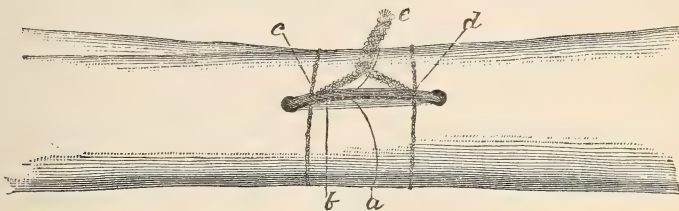
The prepared extremities were brought into accurate apposition, Fig.
3, a, a hole drilled in the lower fragment, the plate adjusted, and the
second hole drilled through the plate.   The plate was then removed and
the clamp applied, Fig. 3, b, seeming to hold the fragments firmly in posi-
tion.   Splints were applied and the limb kept at rest.   Upon examination
the next day, the clamp was found started from the upper fragment and
the displacement reproduced.   I immediately reopened the incision of the
previous day, and with a strong needle, curved in a semicircle, passed a
thick doubled silver wire around each fragment of the bone, twisting the
wires down over the clamp, about a quarter of an inch from each ex-
tremity, Fig. 3, c and d.   The twists thus formed were then brought
together and re-twisted, making the whole bundle, Fig. 3, b, consist of
eight wires, which were brought out of the wound.   The fragments now
seemed so firmly approximated that they could not be separated without
breaking the wires.   A piece of oakum saturated with balsam of Peru was
left in the wound, and the limb placed in an anterior angular splint, ex-
tending from the shoulder to the ends of the fingers, and three firm straight
splints were adapted to the lateral and posterior portions of the arm.   The
patient was then placed upon his back, with strict orders that he should
not be moved for *any* purpose.

Each day the oakum was removed and the finger passed down to the
bone, making sure that the clamp and wires remained in position, until
Nov. 7th, when some hemorrhage occurred from a small superficial vessel,
and the patient was moved and bed changed.

On Nov. 26th the dressings were entirely removed, for the first time,
and slight union was discovered.   The patient was now allowed to leave
his bed, splints were re-applied, and again removed on Dec. 9th, when
union was complete and firm.   About Dec. 20th an attempt was made to
remove the wires and clamp, but they all seemed to be so firmly imbedded
in the provisional tissue, and the wound bore such a healthy appearance

that I cut the wires off as closely as possible to the bone, and left them in position.

When I examined this patient last, about two weeks ago, the wound was almost closed, and the slight discharge not irritating or offensive. The mobility of the elbow-joint was slightly impaired, but improving; the man was employed in the lighter branches of his occupation.

ARTICLE XI.

CASE OF INTRA-OVARIAN PREGNANCY, WITH POST-MORTEM EXAMINATION. By TALBOT JONES, M.D., of St. Paul, Minnesota.

FEW events connected with the parturient state are more disastrous to the patient than the arrest of the vitalized germ in its passage from the ovary to the cavity of the uterus. This is true whether the fecundated ovule be retained in the ovary constituting what is known as ovarian pregnancy; is arrested in the Fallopian tube—tubal; or becomes imbedded in the uterine walls—interstitial. Ventral pregnancy—that variety in which the ovum, after impregnation, escapes into the abdominal cavity, there to remain indefinitely, is fortunately not nearly so fatal as the other varieties, although it too is attended with a very high rate of mortality.

This deviation from the normal course appears to have been known, though very imperfectly, to the ancients, for several of the early writers have alluded to such a condition. Albucasis saw a case where foetal bones and débris were taken from what he termed an abscess, which had formed near the umbilicus. Horstius and Riolan, Jr., have mentioned somewhat similar cases.

Causes.—The etiology of this arrest is very obscure, and must remain so, for the obstacles are insuperable in the way of ascertaining with a reasonable degree of certainty the causes of extra-uterine foetation, from our ignorance of the mechanism by which the fimbriated extremity of the Fallopian tube grasps the ovary. Again, the means at our command for diagnosticating this condition are not very reliable, and cannot be depended upon. Various theories have from time to time been advanced by different observers, yet to candid persons it must appear that with all that has been written our knowledge is still merely speculative. It has been supposed that there exist some morbid condition of the Fallopian tubes, such, for example, as paralysis or spasm, some deviation of its length, but especially some engorgement of its mucous membrane, either congestive or inflammatory, producing mechanical obstruction to the passage of the fecundated ovule. This explanation appears plausible enough, when we remember that the Fallopian tube normally will scarcely admit of a bristle. Some have supposed that the tubal variety is often dependent on complete

closure and obliteration of the tube. Indeed several cases of this variety
have been observed. M. Gaide (*Journal Hebdomadaire*, t. i.) ascertained
that in an interstitial pregnancy the right tube had no uterine orifice. M.
Menière (*Archives Gen.*, June, 1826) encountered a similar case, only
that in this instance the left instead of the right tube was impermeable.
Cazeaux also had the opportunity of observing two cases of complete
stricture of the tube, recorded in the *Bull. de la Société Anat.* Virchow
has noticed that this variety of pregnancy is frequently accompanied by
adhesions of the internal genital organs, caused by false membranes, or
cicatricial tissue, and is noticed much more frequently on the left side.
Why ovarian pregnancy should ever occur must remain problematical.

Among the accidental causes numerous facts seem to show that fright or
terror, occurring at the moment fecundation is being effected, may produce
such a profound impression through the nervous system as to arrest the fur-
ther progress of the ovule towards the uterus.

Curious examples are on record where shock and great agitation received
in coitu have been supposed to produce this. Thus Baudelocque (*Dict.
des Sciences Med.*, vol. xix.) relates a case of extra-uterine pregnancy,
which is supposed to have been due to the shock received during the con-
jugal embrace, from hearing some one trying to enter the apartment.
Lallemand (*Nouv. Journal de Med.*, vol. ii. page 320) cites a similar case,
" and a third woman experienced much alarm by a stone being thrown
through the window of her chamber during the time of sexual connec-
tion." Though these and other cases which might be cited seem to estab-
lish some connection between fright and the abnormal condition under
consideration, yet, notwithstanding the high authority of the advocates of
this doctrine, I cannot accept the explanation as satisfactory, or as having as
a basis any foundation in fact. The truth is that the ovule does not part from
the ovary either at the moment of fructification or during the time of sexual
connection, but may do so several days prior or subsequent to this time, and
this I think is fatal to the theory of fright. M. Dezeimeris relates a case
where, shortly after fruitful connection, a blow received upon the hypogas-
trium was supposed to have caused this anomaly : and Montgomery, in one
reported by Jackson in the *Dub. Med. Journ.*, vol. ii., " thinks a blow re-
ceived on the abdomen shortly after conception produced such a degree of
inflammation and engorgement as to arrest the ovule in its transit from the
ovarium." It is a surprising fact that this accident is much more apt to
occur in widows and unmarried women—a statement which rather lends
support to this theory of fright or agitation. Campbell, in his learned and
valuable memoir, says that out of fifteen cases, five were single, certainly
a very large proportion when we remember the comparatively small num-
ber of unmarried females who become pregnant.

Malformation of the uterus is supposed in some instances to stand in
causative relation. Meadows had the opportunity of examining, *post-mor-*

tem, two cases of this kind, and found that the Fallopian tube, on the side corresponding with the arrested ovule, joined the uterus one inch below the fundus, thus causing " a deviation of the Fallopian canal and consequent arrest of the ovum in its passage to the uterus." Years ago Coste (*Embryogenié Comparée*, vol. i. page 383) made the assertion, which, for a long time, remained uncontroverted, that of all animals woman alone was subject to extra-uterine pregnancy. This, however, is now known to be untrue : it has been known to occur repeatedly amongst brutes, and in Campbell's memoir, there are cited instances in which it has been observed in the hare, bitch, sheep, cow, and other animals. But it is the consideration of the ovarian variety, pure and simple, which chiefly concerns us in this article—that in which the ovum after being fructified lies imbedded in the ovary.

Occurrence.—Ovarian pregnancy is so rare that many eminent anatomists and pathologists deny its ever occurring except where the fimbriated extremity of the Fallopian tube, having grasped the ovary, formed part of the cyst, and which, therefore, strictly speaking, would constitute a tubo-ovarian pregnancy. Those who hold to this belief maintain that fecundation can never occur in the vesicle of the ovary before the rupture of the ovisac. In other words that it is impossible for the spermatozoon to penetrate the ovisac without disturbing its integrity. So accurate an observer as Velpeau (*Trait. Elemen. de la l'Art des Accouch.*, vol. i.) was led into the error of this belief. His opinion was founded upon the hypothesis, which subsequent investigation has shown to have been badly taken, that the ovum could never be impregnated without being detached from its bed. Allen Thomson (*Cyclop. of Anat. and Physiol.*, part xiii.) likewise maintained that intra-ovarian pregnancy for the same reasons never existed.

Farre and Thomas also hold to this view, and the latter has maintained his opinion with his accustomed ability and vigour. But the fact has been established beyond all doubt that the fœtus has been found within the ovary, and has in some instances progressively developed there up to the 4th or 5th month, when rupture of the cyst occurs. " No doubt there is great difficulty in determining the exact locality of the misplaced gestation in these cases of supposed ovarian pregnancy, but there seems to be no reason why, when the fimbria is applied to the ovary which is on the point of rupturing, the spermatozoa should not trail along the tube, and actually penetrate the outer coat of the ovisac just as the ovum is escaping. In this way ovarian gestation would be commenced"—(Meadows). Indeed there are just such cases on record. In the work of MM. Bernutz and Goupil, translated by Meadows, for the New Sydenham Society, vol i. page 249, there is such a case recorded.

At a meeting of the N. Y. Obstetrical Society, Feb. 1865, Dr. Kammerer presented a specimen of extra-uterine gravidity from a woman 30 years of age, who had died a year previous. She had been under treat-

ment for chronic metritis, and had passed from under his care, with the exception of the introduction of a large sound, once a month, to keep the cervix open. Seven or eight years previously she had a child. She became again pregnant, and a little time subsequently was taken suddenly ill with symptoms of internal hemorrhage and peritonitis, and in the course of a few hours died. Upon post-mortem examination, several quarts of blood were found within the peritoneal cavity, and on the left ovary a rent revealing the source of the hemorrhage. On opening the ovary an embryo was discovered about four weeks old. In reply to a question by Dr. E. R. Peaslee, Dr. K. said that he could see no decidua within the uterine cavity (*N. Y. Medical Journal*, May, 1865). The case which I report in this article was one of pure uncomplicated intra-ovarian pregnancy. The earliest example on record of this variety of foetation is found in the *Philos. Trans.*, vol. ii., reported by the Abbé de la Roque in 1682. An interesting case of ovarian gestation has been reported by J. Hall Davis in the *Transactions of the Obstetrical Society of London*, 1860, where the left ovary had degenerated into a mere cyst, and contained a dead foetus.

In addition to these cases I will mention one each recorded by Granville and Boehmer, together with the ten well-known cases collected by Spiegelberg, *Arch. f. Gynæ.*, xiii. p. 74), which include cases of Willigk, Hein, Martyn, Giesserow, Hess, Kiwisch, Wright, Hecker, and others.

Since Spiegelberg collected these cases there have been two additional ones reported, viz., one in the *Gaz. Obstetricale*, Bernutz, Jan. 1879, and one by Patenko (*Arch. f. Gynæ.*, xiv., lately issued).

Cohnstein (*Arch. f. Gynækologie*, xii. p. 367) has formulated certain rules for the proof that ovarian pregnancy exists, and without which, he maintains, no case of this variety is entitled to recognition. His rules are in the highest degree arbitrary, and, although I am quite willing to accept them and abide by the result, so far as they apply to the case I report, still, if adopted without reservation, it is almost certain to deny recognition to others which are clearly cases of intra-ovarian pregnancy, but which for various reasons cannot be established as such with the absolute clearness which a strict compliance with all his rules demands.

Among his rules may be mentioned the following : (*a*) Cylindrical epithelium must be seen under the microscope, taken from the interior of the cavity inclosing the ovum ; (*b*) passage of the fibres of the tunica albuginea into the wall of the ovisac ; (*c*) particles of ovarian tissue in close continuity to the cavity containing the ovum ; (*d*) absence of the ovary of that side ; (*e*) connection of the ovisac with the uterus through the ovarian ligament.

I have no doubt that cases of ovarian foetation are sometimes met which show themselves as such with great distinctiveness, but which are difficult if not impossible of demonstration. For example, in one case the Fallopian tube might be seen ; also the round and ovarian ligaments ; that it

was inclosed within the broad ligaments; absence of the ovary of that side; you might even secure the ovary, post-mortem, and, with a care which would admit of no mistake, open it and find therein a fœtus, as has been done, and yet, because no cylindrical epithelium could be shown, or perhaps no fibres of the tunica albuginea discovered penetrating the wall of the ovisac, therefore the case was not entitled to recognition, although it would be perfectly apparent alike to reason, analogy, and to sight, that it was one of intra-ovarian gestation. Cohnstein's formulated rules, if adopted, would deny recognition to Dr. Kammerer's interesting case, already alluded to, because the latter failed to examine for ovarian fibres and cylindrical epithelium under the microscope, or perhaps neglected to search sufficiently for the ligament of the ovary, although he exhibited his specimen to the New York Obstetrical Society, was closely questioned in regard to it by Dr. Peaslee and other eminent members, and even opened the ovary and found therein the four weeks' embryo. Haselberg has lately reported a case, and described it minutely, still, because he neglected to make mention of the Fallopian tube, the case was for that reason omitted in the number recently collected and reported by Spiegelberg. For the same reason the case of J. Hall Davis and those of Granville and Boehmer would fail of recognition if judged by the rule insisted upon by our German confrères.

Symptoms.—As soon as the impregnated ovum takes up its abode in the ovary the uterus at once undergoes decided changes. There is a determination of blood to the organ, as in ordinary impregnation. A tough, gelatinous mucus, thick and ropy, secreted by the glands of the cervix, plugs the neck of the womb. The organ increases in size to a remarkable degree, sometimes enlarging even to two or three times its ordinary bulk; the mucous membrane becomes hypertrophied and considerably congested. There is a true decidua formed within its cavity, although Dr. Robert Lee does not believe this, and in the *Med. Gazette*, vol. xxvi., cites two cases which came under his observation to disprove such an idea. Velpeau concurred with Dr. Lee in the belief that a true intra-uterine decidual membrane never formed in extra-uterine impregnation. There are now, however, few if any who still hold to this opinion. The late Dr. John S. Parry, from a careful analysis of over five hundred cases (*Extra-uterine Pregnancy*, Phila., 1876), came to the conclusion that a true decidual membrane forms in the uterus alone and never in the cyst. His work is the most comprehensive in any language, and the deductions of Dr. Parry are entitled to great weight. Indeed, the weight of testimony is well nigh unanimous that such a membrane does form, but that it is of short duration, "for, as the ovum does not enter the uterus, it has no office to perform, and therefore, like every other useless organ, becomes atrophied, loses its vascularity, and in a few months has returned to its normal condition." It undergoes a process of disintegration, and is eventually thrown off. For-

tunately this matter is taken from the domain of speculation, and placed within that of clinical observation by Breschet, Campbell, and others. Some of these observers have seen the decidual membrane in the uterus *in situ* or after its expulsion by uterine action, which is usually accompanied by some sanguineous discharge.

In addition to the symptoms already enumerated may be mentioned the fact that in the intra-ovarian variety, the enlargement of the abdomen, if the patient does not die from rupture of the cyst before this is well marked, is not in the mesial line, but upon the side. Sometimes menstruation continues regularly, in other cases it disappears entirely. Severe hemorrhage may occur, which will probably lead to the supposition that abortion has taken place. In almost all cases there is from the start more or less abdominal pain ; this may be so severe as to excite suspicion of peritonitis. Generally, however, the pain is analogous to uterine pain. A sense of weight and oppression is oftentimes felt by patients. There may be present much irritability of the bladder, painful diarrhœa, and perhaps tenesmus. The most reliable of all evidence is that obtained by a vaginal examination. If carefully conducted an enlargement can be readily detected on the side of the uterus, especially if the conjoined manipulation be practised. In the majority of cases the uterus is displaced.

The anatomo-pathological phenomenon which has, perhaps, excited the greatest interest of embryologists, is that which relates to the amnion and chorion, the placenta and cord. Do these form in cases of intra-ovarian fœtation? It does not come within the scope of this article to enter upon a discussion of the different theories and conflicting opinions which have in the past engaged the attention of individual writers or learned societies upon this question. At the expense of being considered dogmatic, I will say at once, and without fear of its being successfully controverted, that wherever the vitalized germ takes up its abode there the ovule will have its proper membranes—the amnion, chorion, placenta, and cord. This view, it need scarcely be said, is by no means accepted by all. There are men whose names carry great weight and whose opinions in such matters are entitled to our most respectful consideration, who far from believing this are rather disposed to believe that these being uterine organs either do not form at all, or, if so, are very imperfectly developed. There are others who maintain that the amnion and placenta are formed in extra-ovarian pregnancy, but the chorion and cord are absent. Cazeaux mentions, somewhere in his works, of a discussion to which he listened before the Academy of Medicine, Paris, during which learned members contended there was present in these cases of extra-uterine pregnancy an amnion but no chorion. The fallacy of this is apparent at once, when we remember the way in which the ovum is developed ; the allantois is necessarily absent if the chorion is not developed, and without the former no circulation can take place between the mother and embryo. The placenta is very much

like that seen in an ordinary case of pregnancy, though greater in circumference, thinner and flatter. The cord closely resembles in size, length, and structure that observed in cases of uterine pregnancy.

Duration.—If observers could agree with reasonable unanimity upon any subject admitting of controversy, it would seem they could upon the question of the duration of the different varieties of extra-uterine fœtation. But it must be admitted that even here there is the greatest difference of opinion. " The duration of extra-uterine pregnancy will depend upon the situation; thus, if it be in the Fallopian tube it rarely lasts beyond two months, whereas ovarian pregnancy will continue for five or six months; on the other hand, in ventral pregnancy the fœtus will not only be carried to full term, but far beyond that period, amounting to several years." (Rigby.)

Campbell, in his monograph, says : " In ninety cases in which we can decide, or nearly so, on the stage of the pregnancy, the fœtus in seventy-nine patients died at the close of the ninth month or soon thereafter—one in the eighth, seven about the seventh, one in the sixth, two in the fifth, two in the fourth, five in the third, and one at the end of the first month." But I cannot help agreeing with Meadows in the doubt he has thrown on the accuracy of these statistics. He says : " I cannot help thinking that there is some mistake in these figures, for whereas Dr. Campbell seems to imply that the chances are largely in favour of the fœtus going to the last month of utero-gestation, the experience of most men is certainly opposed to this, and taking the whole number and varieties of extra-uterine pregnancy, it appears that the chance of a rupture of the cyst increases with each succeeding month, and that very few pass beyond the fourth or fifth month."

It thus appears that of Campbell's ninety cases in seventy-nine, or about 85 per cent., the patients remained in good health up to the close of the ninth month of gestation, whereas the experience of the vast majority of observers indicates that death from rupture of the cyst occurs before the fifth month in fully two-thirds, or 67 per cent. of all cases. The cases in which rupture takes place earliest are the tubal. In the few cases which have been reported of the internal ovarian variety, the rupture occurred on an average some weeks or months later than in the tubal variety. In the one I shall report death from rupture of the cyst occurred during the fourth month. In Dr. Kammerer's case the rupture took place at the end of four weeks; in a case reported by Ramsbotham between the third and fourth month. All these were strictly intra-ovarian.

That internal ovarian pregnancy will not, as a rule, be prolonged beyond the fourth or fifth month is clearly indicated, and the indication is sustained by concurrent testimony. I am aware that this statement is apparently opposed to the view of Campbell on this subject heretofore quoted, but it may be only apparent, since in his statement of the probable duration of extra-uterine pregnancy he may have made, and probably

did make, his estimates without reference to the ovarian variety. Lesouef, who has given this subject careful study, dwells at length on the tendency of the tubal variety to rupture early.

Abdominal or ventral pregnancy may continue indefinitely. A remarkable case is on record where the fœtus remained in the abdominal cavity of the mother for upwards of forty-three years. Even more remarkable still is the case reported by Mr. L. R. Cooke in the *Transactions of the Obstetrical Society of London* (1864). A patient died two days after delivery of a dead child. *Post-mortem* examination revealed a large tumor in the abdomen. On examination a full sized child was found in the abdominal cavity " inclosed in its own membranes and having apparently been developed in the fimbriated extremity of the Fallopian tube."

Termination.—A few words with reference to the probable termination of extra-uterine fœtation. It may be stated as a rule, to which there are unfortunately but few exceptions, that the patient dies suddenly from rupture of the cyst, either primarily from shock incident to this accident, or secondarily of peritonitis from effusion into the peritoneal cavity. The exceptions are those rare cases of ventral pregnancy in which the fructified ovule, after having fallen into the abdominal cavity, there remains and develops, the fœtus advancing it may be to full term, then dying, either remains there indefinitely, with but little discomfort to the mother, or else —and this is much the more common rule—undergoes a process of disintegration and absorption. Not unfrequently the vitalized ovule after falling into the abdominal cavity becomes encysted and may remain there with but little constitutional disturbance for years. There are one or two curious cases on record where the patient continued in fair health for years, although labouring under intra-ovarian pregnancy. Granville had such a case in which the " fœtus lived for four months, but the patient survived ten years and a half, and then died of internal hemorrhage."

When the fœtus dies the circulation in the cyst is diminished, and it takes on rapid atrophy ; becomes more indurated, and is now nothing more than a foreign body in the abdominal cavity. The vital powers begin to flag. Pain may be a prominent symptom from the start, or, on the contrary, may be but little felt. Generally the cyst sooner or later breaks down, ulcerations invade its walls, fistulous communications form openings either into the bowel, uterus, bladder—rarely the stomach—or else through the abdominal parietes ; the fœtal debris quickly pass through these fistulous canals by piece-meal, or the contents are discharged seriatim. This ulceration and discharge may continue for a long time, and undermine the patient's strength. The springs of life are sapped, and, finally, after a variable period, the patient succumbs.

Prognosis.—The prognosis of all varieties of extra-uterine pregnancy *a priori* is extremely unfavourable ; in the vast majority of cases the patient dies, and usually expires suddenly. The mortality has been variously

estimated from 65 to 99 per cent., the latter having reference to the ovarian and tubal varieties, the former to the ventral or abdominal.

To discuss the treatment of extra-uterine gravidity would be inconsistent with the original aim of this article.

The following interesting case occurred some time since in the practice of Dr. J. H. Murphy, of this city.

Mrs. M., age 38, native, married twelve or fifteen years, of average size, and had always enjoyed fair general health. Moved in the higher walks of life. Her three former confinements were perfectly normal. Seven years before the last pregnancy she had been delivered of a healthy child. In May she again became pregnant, as the subsequent history will show, for the fourth time. During the four succeeding months she experienced the usual symptoms of this condition — suppression of the catamenia, morning nausea, enlargement of the breasts, deeply shaded areola, and slight secretion of milk. Even with these symptoms present, strange to say, the patient did not consider herself pregnant. During the middle of August there was noticed some enlargement of the abdomen, not centrally, but rather on the left side. About this time she began to experience severe spasmodic pains in the abdomen, which would usually commence on one side of the inguinal region, and suddenly dart to the opposite side.

Pain in the back was also a concomitant symptom. It was distinctly paroxysmal in character, and so intense as often to cause syncope outright. It was for the relief of this that she applied to her physician for treatment. The latter after hearing her statement told her at once that she was pregnant. So satisfied was he of this that no vaginal examination was deemed necessary. She was advised to try and bear her troubles for a while as patiently as possible. A simple opiate to quiet pain was given.

The patient, it appears, not altogether satisfied with this diagnosis and advice, applied to another physician, who, after a vaginal examination, came to the conclusion that she was laboring under some obscure disease of the left ovary, and advised her to undergo treatment appropriate to such cases. Still dissatisfied and now alarmed at her condition, she applied to Dr. Murphy during the middle of September, and placed herself under his care. The doctor after hearing the previous history of her case made examination per vaginam with the following result :—

The enlarged uterus was felt distinctly retroflexed with the fundus well down in the hollow of the sacrum. The cervix was rather soft and spongy, long, and high up. External os slightly open. Internal os closed. The uterus was movable and somewhat tender to the touch. By conjoined manipulation a tense, resistant tumour was felt, occupying the left pelvis, which gave to the finger an impression of elasticity. It was only slightly movable, globular in shape, and apparently about the size of an orange. By percussion through the abdominal wall over the tumour there was dulness, but not absolute flatness. A distinct outline of the tumour could be traced through the abdominal walls. Obscure fluctuation was detected over the tumour. The patient always experienced some pain on the passage of her urine, and this was voided more frequently than usual. The bladder occupied its normal site. A positive diagnosis was not arrived at, though there was a strong suspicion of either ovarian or tubal pregnancy. The attempts to distinguish different portions of the supposed foetus, as a hand or foot, through the coats of the vagina, failed.

Medical counsel was called, and with the concurrence of all present it was decided to carefully introduce a sound into the uterus.

After placing the woman on her back, this was done, though not without considerable hesitation, since, with these symptoms of pregnancy present, the probability of a normal pregnancy in a retroflexed uterus was not lost sight of. However, the sound readily entered the uterus to the fundus, and no more obstacle to its entrance was noticed than is always experienced in passing this instrument in a uterus bent on itself. The womb was considerably enlarged, measuring by the sound just five inches in length. Neither a tumour nor fœtus could be detected in the uterine cavity. The mother had never experienced any movement of the child, and at no time could fœtal heart sounds be detected. The differential diagnosis now lay between ovarian or tubal fœtation and ovarian disease of a mixed character which we occasionally meet, the gland being converted partly into different cysts containing fluid, and partly into a solid tumour. Great obscurity still attached to the case. Here was a case where many of the symptoms pointed to existing pregnancy, and yet the uterus was empty. The propriety of tapping the cyst through the vagina with a small aspirator needle was now seriously entertained. The operation for gastrotomy was also thought of.

Palliative treatment consisted in giving half-grain morphia suppositories by the rectum for the relief of the intense pain which came on in distinct paroxysms, and which greatly prostrated the patient. Her nervous system was now unstrung; sleep rarely came without artificial aid; the bowels were constipated and the secretions disordered. There was a constant pain in the lower back and through the loins. A discharge per vaginam occurred from time to time, though this was never profuse. Such was the condition of our patient toward the latter part of September, and far into the fourth month of her pregnancy. Being summoned, early one morning, in great haste, Dr. Murphy on reaching the patient found her in a state of collapse, and experiencing violent cramps in the side of her abdomen, much like severe colic. Hemorrhage was evidently the cause, for all the symptoms plainly pointed to this. Cold extremities, pallor of the countenance, excruciating abdominal suffering, clammy perspiration, extreme depression, a flickering pulse, and vomiting were a chain of symptoms not to be mistaken. Death soon closed the scene.

Post-mortem examination, made the day following her death, revealed about two pints of effused blood in the abdominal cavity. The enlarged ovary was inclosed between folds of the broad ligament. All the ovarian tissues were present. The Fallopian tube was secured with the ovary. No portion of it was enlarged, as it would have been were it a case of the tubo-ovarian variety. The specimen, as now seen in alcohol, shows the fimbriated extremity of the Fallopian tube grasping the ovary, at its upper and inner border, and of about normal size. About two inches in length of the tube, including the fimbriated extremity, was detached with the ovary. Unfortunately the ovarian ligament was cut off close to the ovary in removing this from the patient's body. The stump can, however, be seen in the specimen when closely examined. It is to be regretted that the uterus was not secured with the ovary, in order to have shown the relation these organs bore to each other. However, as a report of the case was not thought of at the time, this was overlooked. I have carefully examined under the microscope portions of the mass of tissue near the rent in the ovary, and find that it is true ovarian tissue. " Particles of ovarian tissue in close continuity to the cavity containing the ovum" were

plainly seen. I need scarcely say that "no ovary of that side" was found, except the one in which impregnation had taken place. No fibres of the tunica albuginea were seen passing into the wall of the ovisac, though for very obvious reasons. In order to have demonstrated this, mutilation of the specimen would have been necessary, and it was not considered desirable to do this. The left ovary was about the size of a large orange. There was a rent about three inches long in its anterior wall, revealing the source of the hemorrhage. Bulging out through this rent was seen a four months' fœtus surrounded by its own membranes—the amnion and chorion—with the fœtus still floating in the liquor amnii. By careful dissection the entire ovary was secured without injury to this organ, and without rupture of the bag of waters.

There could be no difference of opinion concerning this case of intra-ovarian pregnancy. Everything showed with the utmost distinctness. The fontanelles in the child's head could be seen through the delicate membrane inclosing the fœtus. The finger could trace the different forms of the skull, the fissures, fontanelles, etc., as well as detect every portion of the child by pinching it up between the fingers. In short, here was a case of pure internal ovarian fœtation, in which the fœtus was entirely surrounded by ovarian membranes and imbedded in the gland, which progressively developed there up to the fourth month, when rupture of the cyst caused hemorrhage into the abdominal cavity, and, as a result of this effusion, death to the mother. Examination of the uterus yielded negative results. It was found enlarged, and its mucous membrane much congested; but whether a true decidua was there present, or had been at any time, could not be determined with any degree of certainty. The ovary, is now preserved in alcohol, has been seen by many distinguished physicians, among whom I may mention Prof. Samuel White Thayer, M.D., of the University of Vermont, and Prof. Ford, of Ann Arbor, Mich., none of whom have expressed the slightest doubt as to its being a case of intra-ovarian fœtation. The specimen was also exhibited before the Minnesota State Medical Society, at its meeting in St. Paul two years ago.

Theoretically, I suppose there will be in the future, as in the past, doubts thrown on the possibility of this condition ever occurring; but for an unprejudiced man, who has once seen this specimen, to still doubt the occurrence of internal ovarian pregnancy, would be for him to doubt the accuracy of his own powers of vision.

ARTICLE XII.

DUBOISIA AS A MYDRIATIC, WITH REMARKS ON ITS PHYSIOLOGICAL AND TOXIC EFFECTS. By WM. F. NORRIS, M.D., Clinical Professor of Ophthalmology in the University of Pennsylvania.

ON the third of last April, Petit, of Paris, and Gerrard, of London, each exhibited to the Pharmaceutical Society of their respective cities a

specimen of a new alkaloid duboisia, with remarks on its method of prepa-
ration, and its analogies to atropia.   Petit maintains that it is a distinct
alkaloid because of its greater solubility in water, a certain fluorescence
of its solution, and the fact that it rotates the plane of polarization to the
right, while atropia seems to have no action on the polarized ray.   Ger-
rard also maintains that it is different from atropia because of its greater
power of neutralizing acids and the peculiar odour it gives off when boiled
with baryta.   It is obtained from a small tree growing in Australia—the
Duboisia myoporoides, which is classed with the Solanaceæ, and attains a
height of about twenty feet.   Dr. Bancroft, of Brisbane, Australia, who
first introduced it to the notice of the profession, called attention to its power
as a mydriatic and to the confusion of intellect and dryness of the throat
produced by it.   In the *Australian Med. Journal*, for Feb. 1877, p. 61,
he compares the effect of the Duboisia myoporoides with that of the Duboisia
hopwoodii, and states that the former has a much greater effect on the
pupil.   The natives call the latter Pituri, and chew the leaves as a stimu-
lant and intoxicant.   In a previous number of the same periodical (No-
vember, 1876) Bancroft describes the action of this drug (D. hopwoodii),
and finds that it kills animals by arresting the respiration.   In his remarks
before the Pharmaceutical Society of London, April 3d, 1878, he states
that the D. myoporoides administered to a dog causes him "to walk straight
forward, and if he get into a corner to struggle and cry for a long time
and paw at the wall, but it appeared never to occur to him to turn round."
"On cats, however, it had not this effect." (*Pharmaceutical Journ. and
Trans.*, April, 1878, p. 798.)   Tweedy, in the *Lancet* for March 2d, 1878,
details the action of the extract of duboisia on the pupil and on the accom-
modation, and shows that a solution of it (1 in 20) caused commencing
dilatation of the pupil in ten minutes, and wide dilatation in fifteen.   He
maintains that the effect on the accommodation went on increasing for
four hours when it reached the maximum.   Its influence passed off
so rapidly that forty-eight hours after this maximum effect, he could
read with effort Snellen $1\frac{1}{2}$ at $5\frac{1}{2}''-21''$, although the pupil was still
large.   In four days the accommodation was "restored, and three days later
the pupil was active and of its normal size."   Sydney Ringer, in the same
article, gives an account of its physiological action, showing that in man
it produces drowsiness, headache, dry throat, rise of pulse, and that it
stops the sweating produced by pilocarpine; while in frogs, like atropia,
it antagonizes the paralyzing action of muscarin on the heart.   Galezowski
also experimented with a watery solution of the extract (1–20), and states
that "the dilatation of the pupil continues eight or ten days, and that its
action is therefore more lasting than atropia, and that it does not, like
atropia, cause any conjunctival irritation." (*Gazette des Hôpitaux*, Avril
4, 1878, quoted in the March-April number of *Annales d'Oculistique*.)
In an abstract of his remarks before the Société de Biologie, *Gaz. Heb-*

domadaire, 22d Nov. 1878, he is said to have compared the "alarming nervous accidents caused by it with those produced by atropia," but no details are given.

In the *Klinische Monatsblätter für Augenheilkunde* for May, 1878, Wecker published an article "On the comparative use of Eserine, Atropine, and Duboisine," in which he asserts that the latter may be advantageously used to replace atropia in all cases where, owing to idiosyncrasy of the individual, atropia excites conjunctival inflammation, and that the rapid mydriasis and paralysis of the accommodation caused by it is so great that a single application will relax all cramps of the ciliary muscle, while it often requires repeated instillations of atropia to effect the same object; and Seely, in the *Cincinnati Lancet and Clinic* of January 11th, 1879, substantiates these statements by his own clinical experience in the use of the drug. The above essays comprise all that I have been able to find in reference to the new mydriatic up to the present date (March 1st), and as duboisia appears destined to play an important role in ophthalmic therapeutics, a recital of my experience with it in my hospital and private practice during the last three months may not be uninteresting to the profession. My supply of the drug was obtained from Mr. Petit, of the Pharmacie Miahle in Paris,[1] and was a semisolid of light yellowish-brown colour, adhering to the end of a probe, and capable of being drawn out into filaments when this instrument was slowly withdrawn from it. It was readily soluble in water, and although labelled neutral, showed in solution a very slight acid reaction to litmus paper.

Its Local Action as a Mydriatic.

CASE I.—Dr. J. W., one of my assistants at the University, æt. 25, whose left eye had been last year carefully examined under atropia, and found to have a hypermetropic astigmatism of $\frac{1}{60}$. With this corrected his vision was $\dfrac{20}{xx}$ and his near point $4\frac{3}{4}''$. Three minute drops of a 4 grain solution of sulphate of duboisia were instilled into the conjunctival sac of the left eye. In six minutes the pupil had commenced to dilate, and was ovoid with its long diameter at $50°$. At 9 minutes pupil is nearly round, and measures 6 mm., and he cannot read Jaeger VI inside of $20''$. At 12 minutes is unable to read without convex glass, and with $+\frac{1}{10}$ half an inch in front of the cornea cannot bring Jaeger I inside of $8\frac{3}{4}''$. At 13 minutes pupil measures 7 mm. and is immobile, at 14 minutes with $+\frac{1}{10}$ punctum proximum is at $9\frac{1}{2}''$. At 15 minutes pupil dilated ad maximum, and measures 8 mm. At 18 minutes with $+\frac{1}{10}$ Jr. I from $9\frac{1}{2}''$–$13''$, sharpest at $11\frac{1}{2}''$. At 20 minutes the same. At 25 minutes $+\frac{1}{60}$ Cy. axis at $15°$ V $= \dfrac{20}{xx}$, and with $+\frac{1}{10}$ combined with same cylinder Jr. I from $9''$– $12\frac{1}{2}''$, best at $9\frac{1}{2}''$. He was examined at 35 and at 45 minutes, but there was no further change either in the size of the pupil, acuity of vision, or in the range of accommodation. He complains of dizziness on rising to walk,

—feels as if his legs would give way under him—and of slight dryness of the throat.

Twenty-four hours after the application with $+ \frac{1}{10} \supset + \frac{1}{60}$ Cy., near point at 9''. In forty-eight hours with same glass near point of $6\frac{1}{4}''$, and pupil has contracted to $6\frac{1}{2}$ mm. On the third day with same combination near point is at $5\frac{1}{2}''$, and without a glass can read Jaeger I up to 9''. On the fourth day with his cylinder alone near point is at 5''. On the sixth day with his cylinder the near point is at 5'', pupil measures 3 mm., while that of the other eye measures only 2 mm. On the ninth day pupil is still a trifle larger than that of the right eye, and with his cylinder the near point is at $4\frac{3}{4}''$.

CASE II.—Miss M. K., æt. 26. $V = \dfrac{20}{XX}$ in each eye, and reads Jaeger I from 5''–18''. Two drops of a 4-gr. solution of the sulphate of atropia were dropped into the left eye, and as soon as practicable thereafter a similar quantity of a 4-gr. solution of sulphate of duboisia into the right eye.

Right Eye—Duboisia.—In five minutes the pupil is vertically ovoid and irregular; in response to change of light and shadow the least-dilated portions show the most movement. It measures $4\frac{1}{2}$ by 7 mm. At 10 minutes it is firmly contracted everywhere except at temporal side; and is irregularly round. At 12 minutes it has contracted evenly all round, and measures 8 mm. At 18 minutes can read Jaeger 19 with effort at arm's length, $V = \dfrac{20}{LXX}$ and sees horizontal lines best. With $+ \frac{1}{10}$ reads Jr. I from $10\frac{1}{2}''–12\frac{1}{2}''$. In $1\frac{1}{2}$ hours $V = \dfrac{20}{LXX}$, with $+ \frac{1}{48} \dfrac{20}{XX}$; sees all lines in Green's dial alike, and rejects cylinders. With $+ \frac{1}{10}$ Jr. I from $11''–13\frac{1}{2}''$. The instillation was repeated on the following day; patient picked out $+ \frac{1}{36}$; and again, on the third day, when she preferred $+ \frac{1}{42}$. She then returned home, and I did not see her for twelve days, but she informs me that on the evening of the second day after the last instillation of duboisia she could spell out for a moment newspaper print. Twelve days after the last application the pupil in strong light measures $1\frac{1}{2}$ mm., and with her correcting glass $+ \frac{1}{42}$ could read Jaeger I from $5\frac{1}{4}''–18''$.

Left Eye—Atropia.—At 11 minutes pupil ovoid and responsive to light, 5 by 3 mm. At 15 minutes nearly round, 5 mm. with scarcely perceptible motion. At 18 minutes can read with difficulty Jaeger I. At 23 minutes pupil 8 mm.; can still read Jr. I at 11''. At 30 minutes can no longer read "brilliant," but spells out Jr. II. At 35 minutes Jr. IV with difficulty at 11'', and with $+ \frac{1}{10}$ Jr. I from $6''–9\frac{1}{2}''$. In one hour and a half $V = \dfrac{20}{L}$, and with $+ \frac{1}{10}$ reads Jr. I from $9''–12''$; pupil measures 8 mm. The instillation was repeated on the following day, and with $+ \frac{1}{10}$ patient could read Jr. I from $10\frac{1}{2}''–13''$; and again, in the third day, with the same result. She says that with this eye she could not spell out any newspaper print till the morning of the fifth day, after the last instillation of atropia. Twelve days after this, pupil measured in strong light $2\frac{1}{2}$ mm., and with her correcting glass $+ \frac{1}{42}$ reads Jr. I from $5\frac{1}{2}''–16''$.

CASE III.—Spasm of the ciliary muscle in a young girl, M. C., aged 13. She complains of being nearsighted and obliged to hold her book too close, with inability to see the blackboard at school. At present V in

each eye $\frac{5}{CC}$, and reads Snellen $I\frac{1}{2}$ from $3\frac{1}{2}''-7''$, and not at any point further off. Nevertheless, after a short sojourn in a dark room, ophthalmoscopic examination shows that the eye is nearly emmetropic, and that the fundus can be seen sharply without any glass. Three drops of a 4-gr. solution sulphate of duboisia were therefore instilled into each eye. The pupils commenced to dilate in 8 minutes; in 11 minutes they were vertically ovoid; in 18 minutes ovoid, sluggish, but still mobile; at 20 minutes they were nearly round, and V had risen to $\frac{20}{C}$. In 26 minutes pupils absolutely immobile and round, and with $+\frac{1}{10}$ reads Sn. $I\frac{1}{2}$ from $7''-9''$. In 55 minutes $V = \frac{20}{LXX}$, and with $+\frac{1}{10}$ Sn. $I\frac{1}{2}$ $9\frac{1}{2}''-10\frac{1}{2}''$. In 60 minutes with $+\frac{1}{48}$ $V = \frac{20}{XXX}$, and in 68 minutes with $+\frac{1}{10}$ Sn. $I\frac{1}{2}$ from $11''-12''$. Three days later her accommodation was $\frac{1}{16}$.

These three are selected as fair examples out of thirty cases in which I have used three drops of a 4-gr. solution of sulphate of duboisia for the purpose of testing the refraction, and in which I have carefully noted the effect every few minutes. In most instances I have put an equal quantity of a like solution of sulphate of atropia into the other eye in order better to be able to compare their action. Every one who has frequently used atropia as a mydriatic has had opportunity to observe the occasional irregularity of its action on irides which are not bound down by synechiæ and in which there has never been any attack of inflammation. These irregularities are much more frequent and exaggerated when duboisia is employed, but here, as in case of atropia, the pupil eventually becomes round. In none of the cases has the ad maximum dilatation of duboisia been any greater than the ad maximum dilatation of atropia; but the pupils have finally acquired exactly the same size, and this is to my mind good proof that we will not succeed in tearing loose resistant adhesions of the iris to the capsule of the lens any better with the new mydriatic than with that so long employed.

The action of duboisia is, however, much more rapid; and we attain usually in adults a full dilatation of the pupil in from 12 to 18 minutes, while in the same individual an equal quantity of atropia requires from 23 to 30 minutes to produce the same result.

As regards the accommodation, we attain usually in from 30 to 50 minutes an effect similar to that produced by atropia in the same individual in from 80 to 100 minutes. The dilatation of the pupil and the paralysis of the accommodation produced by duboisia pass off much more rapidly than those of atropia, and in the thirty cases above referred to, the eye into which duboisia had been instilled recovered its power of reading from two to three days sooner than that treated with atropia.

Its Physiological and Toxic Effects. On Animals.—The sulphate of duboisia, when injected under the skin, produces intoxication, delirium,

dilatation of the pupils, loss of co-ordinating power over the limbs, and relaxation of the sphincters (urination and defecation), with a marked rise of temperature, followed by a decided fall of it below the normal standard.

Experiment 1. — An incision was made in the back of a small terrier dog; and a thermometer-bulb, introduced through it, and placed beneath the skin, showed a temperature of $101\frac{1}{10}°$ F., and at the same time the pulse was 92 and respiration 20. The twelfth ($\frac{1}{12}$) of a grain of sulphate of duboisia was injected under the skin of the belly, and in 10 minutes pulse was 240, respiration 12, and there was violent twitching of the hind legs. In 20 minutes the temperature was 102°, and the pulse 264. At 30 minutes the dog was placed on his feet and staggered in walking—knocking against the tables and chairs—and showed relaxation of the sphincters of the bladder and rectum (urinated and defecated). Ophthalmoscope shows the previously very pink disk, from contrast with the green tapetum surrounding it, to be darker and more congested, and retinal veins fuller. In an hour temperature $100\frac{2}{5}°$; respiration 12; pulse 158. The animal staggers less when placed upon his feet, and has less twitching of the muscles; but is evidently delirious, and when lying undisturbed cries and moves as hunting dogs do when lying before a fire dreaming. A subcutaneous injection of an eighth of a grain of morphia was now given; soon after the animal vomited and became soporose; it was difficult to rouse him. In $1\frac{1}{4}$ hour pulse was 132; respiration 16. Next day the dog was languid, but ate its food; and on the second day was as bright and lively as ever.

Expt. 2. A half-grown healthy mongrel, with pointer blood, about four times the weight of the dog previously experimented with. Temperature under skin of back $102\frac{4}{5}°$; respiration 54; pulse 176. The acceleration of the pulse and respiration was owing to the violent struggles of the animal to prevent the skin being cut and the thermometer inserted under it. The $\frac{1}{12}$ grain of the sulphate of duboisia was injected under the skin of the belly, and in five minutes the respiration had risen to 200, varying in successive minutes between this and 240; the pulse was 200. At eight minutes the pupils were dilated, but responsive to light, the animal struggling violently. At twelve minutes the pupils had become immobile, the struggles less violent, the respiration jerky and irregular, and the same form of delirium in the other case, as evidenced by the cries as if chasing prey, and the motions of the paws as if in running. Urination and vomiting. At 20 minutes the temperature had risen to 103°; pulse 80, intermittent, dicrotic, and feeble; respiration 28. The animal has become sleepy and is quiet. When set free, and placed on its feet, the dog staggers, and has apparent want of power in his hind legs, which go slipping back from under him, but he can still slowly come if called. At 35 minutes stands languid and sleepy, and again vomited. At 50 minutes the temperature had fallen to 99°; pulse feeble and 168; respiration calm, and 24 to a minute.

In an hour further vomiting; next day the dog was languid, and on the second day had regained his usual health and vigour.

Expt. 3. A healthy young albino rabbit; temperature under the skin of the back $103\frac{1}{5}°$; pulse 128; respiration 80. In five minutes after a subcutaneous injection of $\frac{1}{12}$ gr. of sulphate of duboisia, temperature had risen to $103\frac{2}{5}°$; pulse 194; respiration 120. In ten minutes temperature $103\frac{3}{5}°$; pulse 210; respiration 116. The skin inside of the ears has become of a

livid-bluish hue, and the main vessels of the ear are dilated. The irides are widely dilated, and the conjunctiva flushed, especially the limbus conjunctivæ corneæ. In half an hour temperature was still $103\frac{3}{5}°$; pulse, 224; respiration 168. In one hour and a half temperature had fallen to $102\frac{2}{5}°$. The animal when placed on the floor hopped slowly around, smelling at the pieces of cabbage and carrot which were lying there, but not eating them.

In all these experiments the pulse, temperature, and respiration were determined repeatedly by my assistants, as well as by myself. In the two last the rapidity of the pulse and respiration at the commencement was abnormal and caused by the violent struggles of the animals endeavouring to get away and the fear of pain caused by the incision in the skin of the back; but the marked difference in the frequency of respiration in the two dogs after the same dose of duboisia, when they were fully under the influence of the drug, is worthy of note, and is probably due to the fact that in the small terrier the $\frac{1}{12}$ grain was sufficient to overpower the respiratory centres, while in the animal four times his weight, it only served to stimulate them.

Expt. 4. A four-grain solution of sulphate of duboisia was dropped into the eye of a pigeon, but I could observe no dilatation of the pupil from it. The $\frac{1}{12}$ grain was subsequently injected under the skin of the back without appreciable effect, either on the pupils or on the bird. It could still fly, stand, and walk as usual, and in half an hour, when tossed out of the window, flew quietly upwards, and perched on the roof of the building.

Toxic Effects in Man.—Soon after commencing the use of the drug I was induced, by the hope of tearing some old and tough posterior synechiæ, which had resisted the action of an eight-grain solution of sulphate of atropia, to try what could be effected by the application of sulphate of duboisia in substance to the conjunctiva.

C a s e IV.—By means of a number one Bowman's probe I succeeded in placing a small ball of the viscid material, about half a millimetre in diameter, in the lower cul-de-sac of the conjunctiva. It caused no irritation or pain, but the patient complained of being dizzy, and feeling as if the room was going round. This soon passed off, and there was no further disagreeable effect. It failed, however, to tear the adhesions between the iris and the capsule.

Encouraged by the way in which the application had been borne in the case just stated, I determined to try it in a case of mixed astigmatism, in which, after several instillations of atropia, the results were still unsatisfactory.

C a s e V. The patient, J. W., was a healthy girl of 18 years, and, as in the previous case, an exceedingly minute piece of the sulphate of duboisia in substance was held for a few moments in the retrotarsal fold of the lower lid until most of it was melted; the probe was then withdrawn, and the superfluous tears saturated with it pressed out of the eye, and received in a soft handkerchief. A few minutes after, I called the patient to examine the state of the pupils, and she complained of feeling dizzy, and very soon after my attention was attracted by the dark flush of her face.

She was then mildly delirious, pulse 132, and was laid on a sofa. She had a tendency to pick at surrounding objects, and had one or two slight drawings up of the arms, and was very restless. A thermometer under the tongue, when the pulse was most rapid, showed a temperature of $100\frac{1}{5}°$. No treatment was instituted, and in an hour and twenty-five minutes the pulse had fallen to 100. She now became again more excitable, and tried hard to get up off the sofa. On being told to keep quiet, she would at once lie down again, but in a few moments more again try to rise and move off. A subcutaneous injection of $\frac{1}{8}$ grain of sulphate of morphia was now given, and in about twenty minutes she went gently to sleep. An hour later, she was roused to be conducted to her bed in the upper ward, and was able to walk upstairs with but little assistance. She again fell asleep, and about half an hour subsequently awoke rational. The nurse reported, however, that once or twice during the night she got up out of bed, but lay down immediately on being admonished by her. Next day she had entirely recovered.

Therapeutic Uses of Duboisia.—The foregoing experiments would indicate that we have in duboisia an agent similar in its action to atropia, but in some respects more energetic, and the previously quoted experiments of Ringer showing how promptly it stops the sweating induced by pilocarpine, and those of Gubler (*Gazette Hebdomadaire*, 3 Mai, 1878, p. 285), demonstrating its action in the night sweats of phthisis, would lead us to suppose that its range of therapeutic uses would be similar. As regards its local effects on the eye, its greater promptness of action, and the greater rapidity with which the dilatation of the pupil and the paralysis of accommodation caused by it pass off, render it superior to atropia for use in determining the refraction; while, on the other hand, its greater tendency to produce constitutional disturbance should cause it to be carefully used. Although the above case is the only one of poisoning by it which I have seen, nevertheless nearly every patient in whose eyes I have dropped a four-grain solution of it has complained of dizziness within a short time after its instillation, and this is usually noted when they rise from their chair, either to walk about the room or to go into the street. They do not, however, complain as much of dry throat as those treated by atropia.[1] In trying to tear loose posterior synechiæ, I have been much disappointed in its action, and where they had previously resisted the persistent use of atropia, have uniformly failed to increase the effect by the employment of duboisia.

On the other hand, I have had much satisfaction in its use in two cases where atropia called forth marked conjunctivitis. One of them was a severe iritis, and one a case of cataract, where, owing to capsulitis follow-

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[1] Seely, in the *Cincinnati Lancet and Clinic*, Feb. 15, 1879, calls attention to a case where a four-grain solution produced faintness and "strange" feelings; and Gubler (*Gazette Hebdomadaire*, 3 Mai, 1878, p. 285) mentions the dryness of the throat, acceleration of the pulse, and redness of the skin, caused by a subcutaneous injection of a milligramme of it, and comments on the loss of power in the lower limbs of his patients and an inability to stand and walk not produced by an equal dose of atropia.

ing extraction, it was extremely desirable to maintain dilatation of the pupil.   Both of these did well under the use of sulphate of duboisia.[1]

PHILADELPHIA, March 1, 1879.

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ARTICLE XIII.

INTERNAL USE OF QUINIA IN CYSTITIS.   By D. B. SIMMONS, M.D.,
Surgeon-in-Chief to Ken Hospital, Yokohama, Japan.

SINCE communicating to the American Journal (see number for January, 1877, p. 107) my experience with quinia as a sedative to the neck of the bladder, I have made some trials of it in affections of the viscus itself, with the most satisfactory results.   The relief obtained by it in the following case has been so striking that I venture to give it somewhat in detail.

C., æt. 67, residing some twenty miles out of town, sent for me to relieve him from what he supposed to be retention of urine.   I found, however, that it was a severe case of cystitis, of long standing.   An ordinary silver catheter passed readily, showing that there was no considerable narrowing of the canal, though the urine passed slowly, and in a small stream. The prostate was no larger than is often met with at this age without giving inconvenience   As he had been passing blood the day before, I suspected stone or some tumour of the bladder, but a subsequent careful examination only gave negative results.   What he suffered most from was an almost constant desire to micturate, and a burning pain along the urethra.   His urine was very fetid and clouded by muco-purulent matter. He had had no sleep for several nights, and was much exhausted by the absence of it and by his intense suffering.   I advised him to enter my hospital, which he consented to do the following day.

As the case was coming under my control, I resolved to try the quinia treatment to the exclusion of all other, including the time-honoured " diluent drinks."   I accordingly prescribed two 12-grain doses of the drug, in perfect solution, four hours apart.   Though most of the journey to the hospital was by water, he was a good deal jostled about, and as he had told me that even moving about the house increased his sufferings, I did not anticipate any especial results from the quinia which I had ordered. To my surprise, however, on visiting him a short time after his arrival in the institution, I found him not only not worse, but somewhat better than on the day previous to leaving home.   The vesical tenesmus and pain attending it were less acute.   The rapidity with which this had been accomplished, I then and now attributed mostly to the *sedative effect of the*

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[1] Since writing the above, I have received the *Lancet* of the 15th February, 1879, in which Soelberg Wells treats of spasm of the accommodation and the use of sulphate of duboisia.   In this Mr. Wells details a most interesting case of spasm, which was not relieved by atropia, but yielded to the use of duboisia.   In cases where there is no spasm, he says that the pupil is dilated ad maximum ($\frac{1}{4}$ gr. sol.) in from ten to twenty minutes, and the accommodation paralyzed in from twenty to forty minutes—this lasting from three to four days.   He moreover states, "that duboisine acts more rapidly and powerfully in dilating the pupil, and tearing through any existing posterior synechiæ."   As regards the tearing of synechiæ, this is quite at variance with my experience as above detailed.

quinia on the neck of the bladder, which was so markedly shown in the case previously reported under that head. I ordered the quinia to be continued, but in 10-grain doses, three times a day.

On the second day, both the patient and his attendant called my attention to the fact that the urine was less offensive and less cloudy than it had been for some time. From this time all his more distressing symptoms rapidly diminished, and now (the twelfth day of the treatment) he passes his urine but two or three times during the night, and as often in the day, with comparatively little pain or inconvenience.

I can hardly think this and another case in which I used the quinia with such good results mere coincidents, as every one knows that senile cystitis, with or without enlarged prostate or stricture, does not often show a very admirable tendency to get well under any treatment, much less without it. Besides, my own cases are not the only ones in which the quinia treatment has proved satisfactory, as my colleague, Dr. Stuart Eldridge, to whom I suggested the use of the drug in this disease, has, in the only two cases in which he tried it, obtained results equally favourable.

Though it may be claimed that this mode of administering quinia gives no better results than by its injection into the bladder, it has this advantage, that it is much more easily administered. The mode of action of the quinia is no doubt the same in both methods, viz. " by its power of arresting or preventing putrefactive fermentation" in the urine, as, according to Dr. G. Kerner, 70 per cent. of the drug is eliminated by the kidneys in from three to twenty-four hours.

Article XIV.

ON CARBOLIZED JUTE AS A WOUND-DRESSING. By ROBERT F. WEIR, M.D., Surgeon to the New York and Roosevelt Hospitals.

IN the use of Lister's carbolized cotton gauze several objections are found, which materially interfere with the more general use of this dressing in the treatment of wounds. The disadvantages are, first, the difficulty of its manufacture. This of itself often prevents a surgeon, unless living within reach of a large city where the gauze is most likely to be made, from undertaking a trial of the dressing, or is a reason for his not continuing it even when once resorted to.

Without having some impregnated gauze on hand, it is evident that recourse to the antiseptic treatment is not readily to be had ; for, the use of lint, muslin, cotton, or other substances, impregnated with a watery solution of carbolic acid, is, by reason of the rapid evaporation of the acid (95 per cent. at the temperature of the body in the course of twenty-four hours), very unreliable ; indeed, when such contingencies arise, carbolized olive oil (1–20) makes a much more serviceable dressing, and should be employed. Another reason for discouragement in the use of the

gauze comes from the frequent inability, for anatomical reasons, to secure this dressing properly *in situ*. Such difficulty exists, for example, about the male genitals, where it is necessary to leave an opening in the dressing for the penis to emerge; also about the groin; also on the upper part of the chest walls, or in the axilla, as after mammary ablations, etc. Although any gaping of the dressing is remedied to a certain extent by the use of rubber bandages lightly applied, by fastening the edges of the dressing with collodion, or by stuffing in salicylized cotton, yet those having experience in the Lister method will admit that more care and anxiety are demanded in connection with such cases than in injuries elsewhere located.   The third objection is the expense of the carbolized gauze.

Now these objections are well met by the use of the carbolized jute. Jute, as is well known, is the inner bark of a Bengal plant, the *corchoris capsularis*, and is an extremely absorbent substance.   It has been salicylized and used with a certain success by Thiersch; it has also been used by Bardeleben in the form of large masses or " cakes," dipped in an aqueous solution of carbolic acid.   But it is only recently that a way of impregnating it, or the like substance, tow, with carbolic acid, has been found, and for this improvement we are indebted to Münnich, a German surgeon, who, in the *Deutsche Militairärztliche Zeitschrift*, No. 10, 1877, published an article, not only setting forth how this could be done, but also sundry advantages accruing from the use of prepared jute in military surgery.

The trouble that has hitherto been experienced is to properly proportion the amount of resin necessary to cause the *slow* evolvement of the carbolic acid, and yet to prevent the jute fibres being gummed together into a sticky mass.   Prepared, however, by the following formula, Münnich accomplished the successful solution of the question.

He takes for 1 ℔ (500 grammes) of jute—

50	grammes	(ʒxiij)	of carbolic acid,
200	"	(ʒl)	" resin,
250	"	(ʒlxij)	" glycerine,
550	"	(ʒcxxxviij)	" alcohol.

These are mixed together in the following manner: The finely pulverized resin is first dissolved in the larger part of the alcohol with the aid of heat gently applied; after cooling this the carbolic acid, which has been dissolved in the remaining portion of the alcohol, is added, and, after some minutes, the glycerine.   The solution is then poured on the jute and worked up with it, so as to thoroughly moisten all its fibres, and when the mass begins to adhere together, from evaporation of the alcohol, it is carded or pulled apart, and spread out to dry.   The carding, which is to prevent the adhesion of the fibres, becomes very easy if fifty grammes of stearine are dissolved with the resin and added to the mixture.   But in this case the jute dries somewhat more slowly.   Münnich further states that, without the addition of the stearine, the jute will dry in four hours,

and will be ready for use in from twelve to eighteen hours thereafter, and that it will keep best when strongly compressed, wrapped in parchment paper, and placed in a closed box. A good preparation should be entirely homogeneous, have a strong carbolic odor, and the fibres should not be moist, nor adhere on firm pressure.

Jute prepared in this way, without the stearine, I have used in the Roosevelt and New York Hospitals for nearly a year, and, up to the present time, it has been tried in 67 cases of various injuries and operations, viz.: Amputation of leg, 3; compound fractures (arm and forearm), 2; compound fracture of skull, 2; compound dislocation of elbow, 1; resection, elbow, 1; amputation of breast, 5; removal of other tumours, 6; abscess, 9; necrosis, 5; incised wounds, 4; lacerated or gunshot wounds, 11; hydrocele, Volkman's operation, 2; varicocele, 4; hydronephrosis, lumbar section, 1; suture of tendon, 1; lacerated fingers, toes, etc., 10.

During this trial it has fully met all the requirements of an antiseptic dressing. As prepared on the basis of a 10 per cent. strength, it has been found that some loss of carbolic acid occurs during the evaporation of the alcohol, and its strength, after drying, is given by Münnich at 8 per cent., but some analyses which I have had made showed that it often ranged as low as 6 per cent. This compares favourably with the strength of Lister's impregnated gauze, which contains 5 per cent. of carbolic acid. The clinical tests to which the jute was subjected in the treatment of the above-mentioned injuries, have corroborated satisfactorily those instituted in the laboratory by Münnich: he found, for instance, illustrative of the effect of resin in holding back the evolvement of the carbolic acid, that in jute corresponding in height to the sixth or seventh layer of a gauze dressing, after it had been applied to a wound for a space of seven days, the loss of carbolic acid was only 3.5 per cent. In this respect it is also interesting to know that the carbolized jute, kept either in a box or covered by parchment paper, showed after six months only a loss of 3 per cent., and that Lister's gauze, eighteen months after its manufacture, retained as much as 3.8 per cent. of carbolic acid in its meshes. Hence we have obtained data that render it justifiable to preserve a stock of the antiseptic material on hand, provided that it be kept strongly compressed, if jute, and tightly folded, if gauze, and in both cases that it be wrapped in oiled silk or rubber cloth, and stored in a box in a cool place.

Jute is used now in the above-named hospitals in the place of the carbolized gauze; instead, however, of omitting the protective, as Münnich does, this is laid as usual over the line of incision, and over it the jute is applied in a layer one or two inches thick, but extending to the same distance from the wound as in the gauze dressing. The rubber cloth or mackintosh, used by Lister to cause the secretions to flow towards the edge of the dressing, as well as to hinder evaporation, is placed over the jute and secured by a bandage. Sometimes the jute is placed between

two layers of gauze, and underneath the outer one the mackintosh is inserted. This dressing fits with snugness, is very absorbent, differing in this respect from oakum or tow, which collects, as is well known, the discharge on the surface, and not only is readily made, but is very cheap. This latter item is particularly of importance in connection with the employment of antiseptic dressings in hospitals. In reality, the cost of the Lister dressing is of serious moment, and is now occupying the attention of the governing boards of a number of the institutions in which its use is rapidly and satisfactorily increasing. The cost of the impregnated gauze varies from six to eight cents a yard, manufactured in the hospital; the cost of the carbolized jute is fifty cents a pound (plain jute costing from the importers, Dolphin Manufacturing Co., 65 Duane St., New York, eight cents a pound); by observation it has been ascertained that a pound of jute will in large dressings, as for amputations, compound fractures, etc., go as far as eight to ten yards of gauze, and in small dressings it will go much further. The saving is apparent. But through the kindness and skill of Mr. Rosenwasser, apothecary to the New York Hospital, I have been able to make a preparation of carbolized jute of the strength of 7.2 per cent. of acid, after drying, that costs but fifteen cents per pound. This is accomplished mainly by the use of benzine instead of alcohol in its preparation.

The formula is as follows : for 1 ℔ (or 7000 grains, avoirdupois) of jute take—

Crystallized carbolic acid	700 grains.
Paraffin	700 "
Resin	2800 "
Benzine	3 pints.

Or, in other words, for a pound of jute—10 per cent. of carbolic acid is required, 40 per cent. of resin, and 10 per cent. of paraffin, with enough benzine to thoroughly moisten. The larger the quantity of jute impregnated at one time, the smaller in proportion is the requisite quantity of benzine.

I annex the *modus operandi* of Mr. Rosenwasser :—

The resin, in coarse powder, is first dissolved in the benzine; the paraffin, broken up in small pieces, is added; and then the carbolic acid (which must be free from water), previously melted by placing the bottle containing it in hot water. The various solids dissolve readily in the cold benzine. The whole operation should be done in a room in which no gaslight, or flame of any kind, is allowed. The benzine used should, preferably, be that sold as 74° deodorized gasoline. Any receptacle that will answer to pack the jute in tightly, and allow the liquid to percolate through, with a stop-cock or other attachment to draw off the liquid from below, will answer; for small quantities, such as a pound or less, an ordinary tin percolator answers; for larger quantities, an oil can open above, or an old barred with its head knocked out, with a faucet below, will answer.

The jute having been sufficiently picked to insure an even and regular

body, is packed as tightly as possible into the percolator, and the prepared benzine solution poured on from the top, and what has not been absorbed allowed to drain from the faucet into a receptacle below. This is poured on the top again and drained, and again poured on, till all the liquid has been absorbed. The jute is then taken out of the percolator, and the threads partially picked and spread out to dry, either in the open air or in a room suitable for drying by means of cold draughts of air. The inflammable nature of benzine renders it necessary to use extra caution in making large quantities at a time, and, whenever practicable, drying in the open air should be preferred.

There being more liquid than quite sufficient to moisten the whole of the jute, the carbolic acid and resin are more evenly distributed than by the formula of Münnich, who uses so small a quantity of liquid that it has to be sprinkled over parts of the jute and mechanically distributed over the rest, so that a few threads will have a larger percentage of carbolic acid, while the rest will get only that little they can obtain by proximity to those already surcharged with the mixture.

Notwithstanding the great economy in this last method of preparation, yet, for the use of the country practitioner, the formula of Münnich is to be recommended. If jute cannot be had, gauze or mosquito netting can be substituted, but such impregnation, while reliable, is not so good as that originally set forth by Lister.[1]

New York, February 20, 1878.

Article XV.

A Case of Mastoid Abscess following Suppuration of the Internal Ear; Artificial Perforation of the Mastoid Process. By J. W. Waughop, M.D., of Olympia, Washington Territory.

Mrs. T., aged 43, wife of an army officer, after a succession of colds in the head, was suddenly attacked May 1, 1878, with a violent pain deep in the right ear. When called to see her the suffering was so intense, and the auricle so swollen, that it was impossible to bring the membrana tympani into view with the speculum. But little relief was obtained from the internal administration of opiates and other soporifics, and the use of soothing and anodyne applications within and about the ear, until the third day, when matter began oozing from the meatus auditorius externus. The discharge was evidently from the internal ear, as air could be forced out with a hissing noise by attempting to blow the nose with the mouth and nostrils closed, showing that the membrana tympani was perforated. Although the discharge was free, complete relief was not obtained. The auricle was still swollen, with a black sphacelus the size of a dime on its anterior superior margin, which came without apparent cause. The general health was evidently not very good, being impaired by the malaria of Fort Walla Walla, where she had recently been living. And to still

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[1] See Antiseptic Surgery and its Results, N. Y. Med. Journ., Dec. 1877–Jan. 1878.

further complicate matters, pregnancy was present, advanced to the beginning of the sixth month. By the fifteenth day, under the daily use of the syringe for washing out the collected matter, both from the meatus and through the Eustachian tube, the severity of the symptoms had passed away, and the patient was able to sit up a little. But from the first there was more or less tenderness about the mastoid process, which would not yield to treatment—blisters, poultices, anodynes—and by the twenty-fourth day, notwithstanding the discharge from the ear was copious, the skin over the mastoid had become swollen, tense, and red, and the pain intolerable.

To alleviate the suffering an incision was made the full length of the process down to the bone, which gave immediate and marked relief for two or three days. But as the agonizing boring pains returned with, if possible, increased severity, the patient, on the thirty-fourth day, was etherized by Dr. Ostrander, when I bored into the mastoid cells with a Brainard perforator, three-sixteenths of an inch in diameter. The site of the operation was in the line of the incision already made, on a level with the upper margin of the meatus auditorius externus, and about half an inch behind the attachment of the auricle, as recommended by Prof. von Tröltsch in his *Treatise on the Ear*. The cells were readily reached, but much to my disappointment no matter flowed, being shut off by some bony septum. Cautious about thrusting the perforator too deeply into the cells, lest unhappily I might reach the brain, I contented myself with moderate probing, believing that the matter would soon find the opening I had made through the external shell of the mastoid. And I was not disappointed in this belief, for on the next day, after increased swelling of the adjacent soft parts, pus began to flow, attended with great relief. By the fortieth day there was very manifest improvement. The artificial opening discharged for eighteen days, when it healed over, and remained healed for three weeks, when, after slight inflammation, it began discharging again, and continued to do so for three weeks, when it finally closed. The discharge from the ear was profuse, always laudable pus, and continued from May 3d to the 7th of the following August, when it also ceased.

The treatment, besides that addressed to the general health, was the daily washing out of the ear with warm water, to which was usually added soda, as recommended by Hinton in Holmes's *System of Surgery*, and, by putting a rubber ring on the nozzle of the syringe to prevent the outward flow, forcing the water and remaining pus and mucus through the Eustachian tube into the pharynx. After the washing, carbolized glycerine, solutions of tannin, white precipitate, and other astringents were thrown into the ear, and the orifice kept closed with a bit of cotton. After the lapse of two months, when the pains and aches of the ear and parts adjacent had largely passed away, to stop the secretion of pus, French chalk was puffed into the ear with a syringe so as to cover the secreting surfaces. The discharge began to diminish at once, and continued to do so gradually, until it ceased wholly, fourteen weeks from the beginning.

During the progress of the case, the patient had to endure the additional discomfort of two crops of small boils, generously covering the posterior portions of the thorax.

Coincident with the cessation of the discharge was that of ability to force air out of the ear, and upon examination with the speculum the membrane was found entire, and the hearing power almost fully restored.

During the progress of the case I was never able to obtain a good view of the membrane, although the attempt was frequently made, and now, five months after closure, when it can be distinctly seen, no certain trace of the aperture can be found.   The membrane seems normal.

Three weeks after the ear had finally ceased to discharge, on August 30th, the patient was delivered, after a remarkably easy labour, of her sixth child, a fine healthy boy, concerning which she facetiously inquired, as soon as it was born, "Has it got the earache?"

This case is reported to call attention to the artificial perforation of the mastoid, which I suppose is a rare operation.   Hinton, in Holmes's *System of Surgery*, edition of 1870, page 315, says: "There are now nearly twenty cases on record in which the mastoid process has been trephined, or otherwise perforated, for the evacuation of matter contained within it. Of these it may be said that almost every one appears to have been successful that was not performed too late."   Toynbee, in his work on the ear, edition of 1860, page 360, says: "I have never performed this operation, but I should not scruple to do so in a case where the life of the patient was threatened"—which condition must have frequently arisen in his practice, as he gives numerous cases in his work which terminated in death from this fatal disease.   I am sure the life of this patient was threatened, and I am so pleased with the result that I should not hesitate to perform the operation again, should I have a similar case.

OLYMPIA, W. T., Jan. 6, 1879.

Article XVI.

Treatment of Diphtheria by Carbolic Acid and Iodoform.
By J. N. Garnett, M.D., of Columbia, Missouri.

The treatment of diphtheria by the topical application of carbolic acid and of iodoform has proven so successful in my hands and those of my partner, Dr. B. A. Watson, and of a number of my professional friends who have used it at my suggestion during the recent severe epidemic in our city and vicinity, that I feel justified in recommending it as worthy of trial.

The principle underlying the treatment is the destruction of the false membrane by the careful application of a caustic solution of carbolic acid in glycerine, and rapidly subduing the œdema by lightly brushing over all the swollen parts with the same remedy ; and then the direct application of iodoform to any abraded or ulcerated spots, to heal the broken surface, to act as antiseptic, and to allay the pain, irritability, and extreme sensitiveness of the diphtheritic inflammation.

The carbolic acid should be applied with a camel's-hair pencil, under the light of a mirror. The strength of this solution should be proportioned to the thickness of the false membrane, the object being its complete destruction and removal. In cases seen early, a solution of equal parts of carbolic acid and glycerine will answer well. Generally, in twelve hours after applying the acid by a careful manipulation with the brush, the whole of the false membrane can be removed. By using the camel's-hair pencil and freeing it of the superfluous liquid, the whole of the inflamed and swollen parts can be beneficially brushed over with it, but on the false membrane it should be used more freely, and, if it is thick and heavy, in a more concentrated form. The iodoform, reduced to an impalpable powder, should be blown into the fauces through a glass tube. The tube can be made to take up a sufficient quantity by dipping it several times in a vial containing the iodoform. All the ulcerated or abraded surfaces should be completely covered and the patient ordered to avoid unnecessary swallowing, hawking, or other movements calculated to disturb the coating left in the fauces. Of course, some attention should be paid to the dose of iodoform thus introduced into the system. It is best to apply these remedies sufficiently often to fulfil the indications mentioned. Where false membrane shows a tendency to rapid formation, I have used them three times a day for several days in succession.

In all cases we are in the habit of giving a mercurial purge occasionally during the first stages, and quinia and iron during the decline of the disease. I was induced to try the above plan of treatment in diphtheria from the unsatisfactory results obtained from the methods in common use, and by having witnessed the great benefit to be derived from the subcutaneous injections of carbolic acid in phlegmonous erysipelas, as recommended by Hüter, and its discutient effects in carbuncles and boils when applied concentrated to the surface.

Professor J. H. Duncan, of the Medical Department of the State University of Missouri, in an article on the "Pathology and Treatment of Diphtheria," published in the number of the *Linton District Medical Journal* for January, 1878, gives this as *the best* treatment, and his positive and strong endorsement is the result of personal experience as to its value, it having been successfully used in his own case, at my suggestion, during a recent and severe attack of diphtheria.

REVIEWS.

ART. XVII.—*Parliamentary Commission. Lunacy Laws. Report from the Select Committee on Lunacy Law; with the Proceedings of the Committee.* Ordered by the House of Commons to be printed, 28 March, 1878.

IN none of the psychological inquiries of the time have we found any attempt to discover the law which regulates the popular movement that takes its final expression in some acts of legislation. At first blush it would seem as if every law of the State originated in some public or private necessity too strong and too obvious to be overlooked or misunderstood, but one needs not to have lived to extreme old age to have observed that much of our legislation has been borne in upon us on waves of public sentiment, as tumultuous, as frothy, as irresistible, as the waves of the sea. It strikingly represents the currents of feeling prevailing at different periods, and is full of historical significance. For many years together in the early part of the present century, no member of the Great and General Court of the old Bay State thought the claims upon his service fully answered without advocating some new law respecting the militia, or the taking of ale-wives in Taunton River. In later times the legislative thought has been particularly expended upon ordinances ever new for the suppression of intemperance, and has filled the statute book with countless enactments touching the rights and property of married women. The American people have a passion for making laws, and no member of a legislative body would feel that he had done justice to himself or met the reasonable expectations of his constituents, if he failed to bring forward some project eminently necessary to promote the welfare of the race. If he have no axes of his own to grind, he will be furnished with plenty of material by those restless beings who live and die in the belief that all their pet grievances can be relieved by an act of the Legislature.

For the past few years, this proclivity for regulating everything by law has been manifested, in many parts of our country, on the subject of the insane and whatever is connected with their custody and care. It seems as if every amateur philanthropist, looking around for objects worthy of his benevolent designs ; every member of that abounding class who have an eye only for the shortcomings of institutions and of the men and women who are intrusted with their management ; every aspiring candidate for distinction who conceives that he has been slighted by some of their officers ; every quondam inmate of them, who, improved enough in their wits to obtain their liberty, but with hearts full of unkindness towards all who had any part in once depriving them of it : such persons, one and all, fill the air with complaints against hospitals for the insane, and clamor for new legislation respecting them.

In Great Britain a similar state of feeling has sprung up, and given rise to a formidable amount of legislation. But all this has failed to satisfy a class of people, as obtrusive and noisy abroad as they are here, who are

satisfied with nothing but endless agitation.   And so the House of Commons, in the session of 1877, appointed a committee " to inquire into the operation of the Lunacy Law, so far as regards the security afforded by it against Violations of Personal Liberty."   The attention of the committee, they say, was mainly directed to three questions.

" First, whether a possibility exists of persons being unduly deprived of liberty by means of a false allegation of lunacy.

" Secondly, whether persons properly detained are placed under restraint of a nature calculated to retard their cure and consequent discharge.

" Thirdly, whether undue obstacles are opposed to their release when restored to sanity."

On these questions a cloud of witnesses was heard—Commissioners in Lunacy, Chancery Visitors, officers in hospitals, physicians, and quondam inmates of asylums.   The inquiry took a wider range than might be implied by these questions strictly considered, and much of it referred to local laws and practices of little interest to us.   We need only notice those matters in which we are as deeply concerned as the English are.

The first thought suggested by this proceeding is one of surprise that, in view of the multiplicity and rigor of the existing laws, embracing, it would seem, every possible contingency, and enforced by the severest penalties, it should have been deemed necessary or desirable.   It only shows how a legislature may be forced into measures by the persistent pressure of people who run wild with a grievance, and succeed in infusing some of their ardor into a few well-meaning, but credulous and inconsiderate members.   This explanation was abundantly confirmed by the result of the investigation, for it will appear that with a few exceptions of minor importance, the commission did not see fit to recommend any change in the existing laws.   Either the allegations put forth as grounds for additional legislation were not established by the evidence, or the proposed objects were met by such a diversity of opinion as to prevent all interference.

As to the main question, whether, as a probable fact, sane persons could be deprived of their liberty under the pretence of insanity, the evidence was remarkably satisfactory.   Some of the witnesses who had been committed to asylums, were loudly confident that they had never been insane, and consequently, that their confinement was an outrage.   Others, while admitting that they had not been exactly right, contended that their confinement in an asylum was needless, and therefore an outrage.   Others complained that they were kept long after they had recovered, and had suffered grievous ill by this protracted detention.   Besides these, whose evidence seems to have made little impression on the commission, no other witness adduced even a single instance of wrongful confinement, and the general sentiment among commissioners and witnesses was, that such cases must have been extremely rare.   Mistakes had been occasionally made where opportunity was wanted for sufficient investigation, persons being committed to an asylum who were labouring only under delirium tremens or some other temporary cerebral ailment.   One might suppose that with such experience the laws might have been regarded as affording all the protection that could be reasonably expected from human enactments. Under the vague apprehension that men entrusted with a certain duty would be strongly disposed to abuse their trust, various additional safeguards were suggested.   Among them was that of a board of experts, consisting of persons having some practical acquaintance with insanity, who,

alone should have the power of granting medical certificates. This idea has met with some favour in this country, and in one State, at least, a serious attempt has been made to have it provided by the legislature. Although we do not apprehend with Lord Shaftsbury, that such a board would, in the end, "shut up people by the score," yet it is so obviously impracticable that it scarcely deserves serious attention. To bring it into something like an easily working condition by making its number large, and consequently, its members conveniently accessible, would, to that extent, defeat the purpose of its creation. One of the commissioners favoured the plan of vesting in some public functionary the ultimate authority for consigning a person to an asylum, as is done in Scotland where certificates of insanity must be submitted to the sheriff and countersigned by him to make them available. No doubt this course would ensure their being made in proper form and by proper persons, but it is not very obvious how it can affect the question of the mental condition of the person concerned. Either it must become a mere matter of form, or involve the necessity of the sheriff himself examining the patient in every case. If the latter, it is hardly supposable that he would often, if ever, dissent from the physicians. We are a little surprised that no mention was made in this connection of a trial by jury, for among all English speaking people that is popularly regarded as the great bulwark against infringements of personal liberty. To treat a person, guilty only of being visited by an attack of cerebral disease, like one charged with some criminal offence, would produce a smile were it not restrained by a sense of its conflict with every idea of social propriety, and especially of its immediately mischievous effect upon the patient. Nothing, in fact, could more surely confirm the apprehensions and suspicions that swarm in the mind of most of the insane than a proceeding of this sort. And yet it has been adopted in one or two of our States. The fact illustrates one of those extraordinary phases of public feeling when people cast aside all regard for common sense and time-hallowed usage, and follow the dictates of a woman with a hobby roaming through the land proclaiming the oppressions of the asylums and the wrongs of the insane. It would be only a waste of words to show the inconvenience of such a practice, the cruelty of its operation on the patient and the friends, and its utter inefficiency to prevent the apprehended evil. The results of the experiment as shown in particular instances, may convince its friends of the sad mistake made by such a proceeding, and probably nothing else will.

The existence of insanity being admitted, does the fact absolutely warrant the placing of the patient in an asylum, and if not, under what conditions alone should this measure be allowed? Little was said upon this question, though scarcely inferior in importance to any other in the whole of this inquiry. That great difference of opinion respecting it prevails both among doctors and lawyers, and that this difference gives rise in practice to much embarrassment and trouble, is known to everybody who has paid any attention to the subject. Now, a person committed to a hospital after a most careful and intelligent examination of his condition, and the strong and honest conviction on the part of his physicians and friends of the necessity of the step, may be discharged the very next day by order of any single law judge. To arrive at anything like clear notions on the subject, we must recognize the objects sought for in consigning an insane person to a hospital. If we believe them to be proper—necessary to secure the highest interests of the patient—then we have a

clear, well-defined issue with the courts, who can see only an illegal in-
fraction of personal liberty. These objects, then, are, 1, to restore his
reason; 2, to preserve him from personal injury to himself or to others;
3, to preserve him from acts *contra bonos mores ;* 4, to preserve him from
being ruined by people ready to take advantage of his infirmity by lead-
ing him into foolish speculations, or infamous alliances. We contend
that any one of these purposes should justify commitment to a hospital,
but not so the courts. We are not sure they would always so regard any
one of them, except the 2d. Again and again they have decided that
danger to himself or to others is the only legal ground for holding an in-
sane person in confinement. In fact, requisite means only are needed to
liberate the larger part of the insane now in durance, and shut up half the
hospitals in the country. How men of some experience in life can readily
recognize the propriety of placing in a hospital one bent on taking his life,
while they regard it as a high-handed infringement of the law to thus pre-
vent that more painful moral suicide implied in the sacrifice of honor,
honesty, and purity, we know not. Of course, the courts must administer
the law as they find it, but it is here not so well settled as to forbid us to
admire the moral courage of that distinguished magistrate, the late Chief
Justice Shaw, of Massachusetts, who, in a case of this kind, announced his
determination to be governed by a higher law—the great law of humanity.
And he might have added, the great law of common sense—that law fol-
lowed by the people of this community, when, one hundred and twenty-five
years ago, they prayed the legislature to help them establish a hospital
for the insane, many of whom, they say, "are continually wasting their
substance, to the great injury of themselves and families, ill-disposed per-
sons wickedly taking advantage of their unhappy condition, and drawing
them into unreasonable bargains." Are we wiser than our fathers? or are
we only yielding to the demands of a mawkish sentimentalism about per-
sonal liberty? If the objects above mentioned are not provided for by
existing laws, let the defect be met by suitable enactments. There is
nothing to prevent the legislature from declaring, if it pleases, that any
one of them shall be a sufficient warrant for committing a person to a
hospital.

In the examination of the Parliamentary Committee, no point excited
greater interest than the discharge of patients from confinement. Once it
seemed quite enough to provide by suitable laws for their removal to a
hospital, it being supposed their discharge therefrom would take care of
itself. It was reserved for the present generation to be alarmed by the
apprehension that to increase the gains of their keepers, they would be
detained long after recovery. True, no case of the kind has ever been
clearly proved, certainly not in this country; and before this committee
the complaint was made chiefly by those who had been patients them-
selves. They strongly protested that they had been kept too long; indeed,
the most of them were quite certain there was no sufficient reason for their
being detained at all. The commissioners failed to see the need of fresh
legislation on this matter, nor are we sure that it would relieve us in this
country from the troubles that spring from this source. Whether the time
has come when a patient can be safely discharged, would seem to be a
strictly medical question, and none able to answer it so correctly as the
officers of the hospital. He has been under their daily, hourly inspection
for weeks or months; they have learned his inmost thoughts and feelings,
with the changes of bodily condition connected with them; they have be-

come familiar with his ways and manners, and have observed manifesta-
tions of disease which only the practised eye can discern. Their judg-
ments ought to be conclusive, but in the courts they are often overborne
by the statements of people—embracing, it may be, the judge himself,
who calls the patient to his side, and converses with him a few minutes—
who know nothing about insanity, and very little about the individual in
question. The fact is ignored, because not known, that the conditions of
insanity are often obscure, and that it abounds in phases that may be
readily mistaken by the unskilled observer for the unclouded light of reason.
Nothing is more common, in the course of the disease, than periods of
apparent restoration of reason, the patient becoming calm, lucid, and cor-
rect in his ways; but they soon pass away, and are succeeded by the for-
mer turbulence and delusion. The medical officers of the hospital are
prepared by their experience and training to be able to distinguish, gen-
erally, in these remissions, the latent element of disease, which, sooner or
later, will take the form of unquestionable disorder. Even they are some-
times obliged to wait patiently for revelations that time only can make.
Even when this change is actual convalescence, a period of probation is
required in order that it may lead to assured recovery. This is a fact that
the patient and his friends are often unwilling to admit. With the cus-
tomary disregard of prudence in matters of health and disease, they think
they know better than the doctors, and are ready to run the risk of relapse
by a premature removal. It often happens, however, that there is a differ-
ence of opinion in the family councils, or some unscrupulous lawyer has
thrust himself into the case, and under the writ of habeas corpus the
matter is carried into court. With some experience in this direction,
we are obliged to say that we have never known a plain statement of
the reasons for further detention, as given above, to prevail with the
court. Here the old adage, *Quilibet in suo arte credendum est*, seems to
be utterly ignored. How such a complete inversion of the ordinary rules
of evidence could have prevailed, is not easily understood. We are re-
luctant to believe that medical men in charge of the insane are either
supposed to be incompetent to recognize the condition of sanity when it
returns, because, seeing so much of insanity, living among the insane as
they do, they come to regard almost everybody as insane, or are sure to
be wrongfully biassed by mercenary motives. It springs, probably, from
that misplaced sympathy with the weak and unfortunate, which, with the
proverbial result of zeal without knowledge, ends in doing its objects more
harm than good. The sequel of such discharges is generally mischievous,
though not always so deplorable, thank God, as one alluded to a year or
two ago, by a judge in this city, with an honourable record of long and
worthy service on the bench, who said that once, yielding to the usual
kind of evidence in this class of cases, he had discharged a patient from
the Pennsylvania Hospital, and a day or two afterwards learned that he
had drowned himself in the Delaware—a fact better calculated to suggest
a valuable lesson than to inspire comfortable reflections.

Respecting the present mode of proceeding for placing persons in hos-
pitals for the insane, little or no complaint was made; but there are some
things in it we certainly should not recommend for adoption here. The
law requires that the physician should state the grounds of his opinion,
distinguishing between such as he learns from others and those which
come under under his own personal observation; and the statute declares
that no person shall be received into an asylum on a certificate founded

only on facts communicated by others. With our experience we cannot avoid the conclusion that in respect to a number of patients not very small, either the statute is evaded, or they are debarred from obtaining the custody and care which they clearly need. In cases of acute dementia or melancholia, where the person is completely silent; or of circular mania, where he gives ingenious reasons for his conduct; or of those who, while they entertain delusions, declare they have renounced them; or that larger class, whose insanity is manifested solely in their conduct, while their conversation is correct and rational,—are all such cases to be denied admission to the hospital because the physician, in the hour or two which he gives to the examination, can detect nothing clearly indicative of insanity? Certainly, no one much conversant with the insane can have failed to meet many cases in each one of these forms of the disease. In the treatment of bodily disease, our course is often determined by information derived from the nurse or the family, and it is mostly so when prescribing for children with whom, as being unable or unwilling to describe their condition, the insane may be compared. The rule in question, if adopted in this country, would present one of those curious inconsistencies so common in the prevalent notions and practices regarding the insane. The very physician whose certificate would be rejected because unable to see for himself any manifestations of the disease, is allowed to go upon the witness-stand and pronounce opinions respecting the mental condition of a person on trial founded solely on the testimony given from that same stand— opinions that may settle the question of life or death.

Notice was taken of the admission of visitors to the asylums, and we are glad to find the commissioners saying, "the old system of turning an asylum into a resort of sightseers has happily passed away with other enormities." We wish *we* could say as much on this matter, but we are obliged to acknowledge, with shame and confusion of face, that our asylums are too much regarded as show places for the indulgence of an idle curiosity. We could mention one in the midst of a community second to no other in culture and refinement, which every week opens its doors to a host of sightseers, before whose curious eyes the assembled patients are brought out to display their mad antics and motley costumes. To those who come with an intelligent interest, and to such only, should this public visiting be allowed, but always restricted by a proper regard to the peace and comfort of the patients.

In nothing connected with the hospital management of the insane is the public more widely and obstinately wrong than in the prevalent notions respecting the visits of friends. It is hard to convince people that a patient may be and often is injured by an interview with a dear relative or an intimate friend. They cannot understand that the principal element in the moral treatment of insanity consists in an entire change of surroundings, whereby all existing trains of association are broken, and the mind is introduced to new persons, new things, new scenes. They will scarcely believe that the figures of a carpet or a wall-paper, or the sound of a familiar voice, are alone sufficient to maintain and foster that intense morbid introspection which, in one shape or another, characterizes almost every phase of mental disease. They are seldom quite reconciled to the refusal of the officers of the hospital to permit an interview between the patient and a beloved friend. And yet, if there is any one thing in the management of patients known to be decidedly mischievous, in most recent cases and in many old ones, it is such interviews. The conversation turns

on matters of the deepest interest, which are vividly brought to mind; the slumbering irritability is revived; and sleepless nights and loss of appetite follow. It is one of the discouraging experiences of the physician of the hospital often to see the improvement effected by many weeks or months of careful management, rapidly vanish after the ill-judged visits of friends which he was powerless to prevent. Hospitals have incurred no little popular odium because this privilege of visiting the patients has been denied to casual acquaintances, impelled only by idle curiosity; and those who suppose themselves possessors of the advanced thought on the subject are in favor of making the hospitals as open to the public as hotels and corner groceries. This notion springs, no doubt, from the vulgar belief that whatever in the management of any institution looks like secrecy we are bound to regard as proof positive of wrong done or intended. Like many other notions respecting asylums, this belief is not amenable to reason, simply because it has no true foundation.

This indiscriminate visiting also gives rise to a kind of mischief little thought of by the world at large, but which is often of the most serious character. The visitor may abuse the opportunity to further some mercenary interest of his own, and induce him to put his name to obligations injurious to his fortune. Even a patient's own family may commit this kind of wrong. We knew a wife to obtain from her husband a power of attorney whereby she sold some city lots, which contracts were disputed years afterwards by the children when they came of age, and much litigation followed. Even a little indiscretion, or lack of proper judgment in dealing with the insane, often leads to most serious consequences. For instance—and these instances are not hypothetical—a casual visitor tells a woman just emerging from the clouds of disease, as an interesting piece of news, that her child died a day or two before; a young man presents his sister, strongly suicidal, with a penknife; and another allows his wife to get possession of his valise, from which she takes his razor and cuts her throat on the spot. Minor offences, such as giving patients articles of food or jewelry, which they ought not to have, of inspiring distrust of their friends and disparaging those who have them in charge, are common enough in every hospital physician's experience. No rules or arrangements can entirely prevent such things, but the public should contentedly bear with all the vigilance and limited access to patients, which alone can make them as harmless as possible.

A little was said on the subject of allowing more liberty to hospital inmates by abolishing locks, bolts, and window-guards. Considering that this movement, as displayed in a certain Scotch asylum, has been hailed as a glorious reform by those worthy people who represent the "advanced thought" on all matters pertaining to insanity, and pressed upon us for our imitation, we are certainly surprised that so little account was made of it. We have no reason to think that the commissioners were aware that the experiment had long since been tried, and its merits and demerits thoroughly tested. We may say here, for the benefit of those who undertake to instruct others, that in most American hospitals it has been the practice, more or less for forty years, to leave some halls wide open, from which the patients can go and come at their pleasure. The commissioners favour the measure in a way that shows they regard it rather as the substance of things hoped for than as the evidence of something much seen.

In the matter of mechanical restraint, notwithstanding the immense

importance attributed to it in Great Britain and the controversy it has excited, scarcely anything was said. This is surprising, for if the good resulting from the system of non-restraint were half as much as is claimed for it, we should naturally have expected to find it fully discussed—its beneficent effects specifically set forth, and opinions for and against impartially received. Probably the commissioners regarded it as a foregone conclusion, and all opposition to it with supreme indifference.

We regret for our own sakes on this side the water that so little came out respecting the proper size of hospitals for the insane, for at present no question touching the care of the insane has a closer bearing on the future of these institutions. The late Sir James Coxe, one of the Scotch Commissioners of Lunacy, when examined on this point, stated the case exactly when he said, " My own view is in favor of small asylums. I think when you come to large asylums, the patients are lost in them, and I do not think they are more economical." When asked what he regarded as the proper limit, he replied, 200. Truer words were never uttered, but we dare not believe that such words will dispose at once of the favorite fallacy that the larger the hospital the cheaper its maintenance. It is too much, we fear, like a class of diseases called self-limited. It must run its course independent of reason or arithmetic.

The subject of the correspondence of patients received some notice, the common opinion of the witnesses being that no change was needed in the present arrangement, which is that all letters thought by the superintendent unsuitable to be sent to the parties addressed, are forwarded to the Commissioners in Lunacy. This disposal of them seems not very complimentary to the discretion of that officer, who might be trusted, we should suppose, to pass judgment upon them, and destroy them if found improper to be sent. It may not matter much with the class of persons found in English public asylums, but people of a higher social standing might justly object to having their foolish letters exposed even to a board of commissioners. This arrangement, however, is not so bad as one adopted in several of our States at the instance of the woman already alluded to. Their respective legislatures having been convinced that the inmates of our asylums are debarred from communicating with their friends and others, and thus become the victims of unutterable wrong, they enacted that letter-boxes should be placed in every hall of every hospital, into which patients might drop their letters, the keys of the boxes being kept by some functionary delegated for this purpose, who should open them at certain periods. The mode of disposing of the letters varies somewhat in different States, but all agree in the common purpose of keeping them out of the hands of the officers of the establishment. In one State it was also ordered, that letters sent to patients should be delivered unopened. Under this benign arrangement a young woman received a quantity of morphia, enough to destroy life, which she had solicited from her correspondent. The promoters of this scheme of letter-boxes were unwilling to learn that it was entirely uncalled for, useless for any proposed end, and sprang from sheer ignorance of the ways and feelings of the insane. As it was a pet measure of the amateur reformers in lunacy, it may be well to see what has come of it.

Dr. Earle, Superintendent of the Hospital at Northampton, tells us in his report for 1875, that from April, 1873, to April, 1874, 7254 letters were sent in the usual way, 1664 by patients, and the rest by officers and employés. After the boxes were put up three only were placed in them

in the course of the year.   One was a senseless, incoherent effusion, of a kind very common in hospitals for the insane, and addressed to the doctor himself.   In another the writer declares, among many other things, that he is " more manly, angelic, feminine, than all Massachusetts put together," and " two degrees saner than all New England put together."   The poor man, no doubt, overrates his perfections.   Had he narrowed the range of his comparisons down to the authors and abettors of this postal scheme, we should certainly not have been disposed to question his pretensions.   The third letter was addressed to the Secretary of the Board of State Charities, and the doctor never learned its contents.

Dr. Walker, Superintendent of the Boston Municipal Hospital, says: " At the last visit of the secretary to us, he found but a single letter in all the house, and that of no account.   In our best wards, no notice is taken of the boxes; and, in the lower wards, they are filled only with chips and bits of paper—mere rubbish!"

The Secretary of the Board of State Charities, who has the control of the boxes in Massachusetts, gives, in his report for 1875, his account of their contents during a period of three months.   He says: " The aggregate for all the asylums has been about 75 letters and half a bushel of refuse consisting of bits of almost every conceivable thing the inmates could obtain and crowd into the openings of the boxes. . . . The correspondence obtained has been addressed to persons in almost every rank of life, from the Queen of England and the President of the United States to the families of insane paupers confined at Tewksbury. . . . The letters revealed nothing that demanded investigation."

This is the result of the experiment in a single State, it is true, and we have no statistics of its operation elsewhere, yet as human nature, sane or insane, is much the same all the country over, we presume the story in other States would be very much like this.

The commissioners, in summing up the evidence, say, that " allegations of *mala fides*, or of serious abuses, were not substantiated.   Much of the evidence which extended to a great length, amounted to little more than differences of opinion among medical men, questions of liberality or parsimony in the arrangements of asylums, suggestions with reference to the letters of patients and visits of friends, or complaints of hesitation among superintendents and relatives to believe in the perfect recovery of patients." They, therefore, do not recommend any material change of the existing laws.   Their mode of commitment is essentially that in use in most of our oldest States, viz., a certificate of insanity signed by two medical men, and an order or application from some relative or other responsible party. There is an adherence to the mere form of the papers—even to the dotting of the i's and the crossing of the t's almost—so rigidly insisted on as to seem, from our point of view, the reddest of red tape.   If, for instance, the subject of the certificate is called Mary Anne Jones, the document will be invalidated if in any part of it the name is written Mary Ann Jones. The same thing would follow if the street and number of the person's residence are omitted, or if the person is referred to at all as the said Jones, instead of Mary Anne Jones.   Within twenty-four hours after admission, the papers must be sent to the Lunacy Commissioners, and if in the provinces, to the Clerk of the Peace also, by whom they are closely inspected, and many of them returned for correction.   In one year, it is said, out of 12,175 certificates received by them, 2314 were returned for amendment.   If anything like an adequate compensation is gained by this

marvellous amount of inspection, we cannot see it. Here, surely, the letter killeth.

The distinguishing feature of the English supervision is the Lunacy Commission, composed of six members, appointed by the Crown. Their business is to visit all the hospitals and asylums, public and private, observe all matters of management, of diet, occupation, warming and ventilation, architectural construction, to give advice and suggest improvement, and make an annual report of their observations. Their function is, chiefly, advisory, but it is none the less potent for that. With the exception of one or two members of the Board who have seen some actual service in the care of the insane, they have no special qualification for the duty. They are simply very respectable, intelligent gentlemen, whose claims on the bounty of the Crown are answered by an office with easy service and a comfortable salary. It is a very prevalent opinion, however, that this commission has done good service, and that the present high condition of the English institutions for the insane may be fairly attributed to its counsels and influence. How much foundation there really is for this opinion, is not very apparent. We can easily conceive that a body of men having had some personal experience in the management of these institutions might, by frequent and close inspection, contribute greatly to their improvement. But the members of the English Lunacy Commission, with one or two exceptions, are usually not men of this kind. Many of them, probably, were never in a lunatic asylum, previous to their appointment. To suppose they can be of any practical service is to ignore the common belief that one must understand the subject himself before he is capable of instructing others. The whole number of insane officially known to the Commissioners in England and Wales in 1877, was 66,336, and the number of admissions that year, 12,175. The metropolitan licensed houses are visited six times a year, the provincial four times, and all others (containing more than two-thirds of the whole number) once a year. Each of the six commissioners, therefore, must visit at least 11,056 patients, and the greater part of them but once a year. The visit to the establishment is seldom prolonged, if we do not mistake, beyond a single day. It needs no formal calculation to show that the amount of time devoted to each patient must, on the average, be infinitesimally small. And yet such visits are supposed to be " safeguards against undue detention and neglect." True, the real condition of most of them is too obvious to admit of any question, but of a large proportion their mental condition must be a matter of special inquiry; and how few of them could receive it in the little time devoted to the purpose ! But taking the event most likely to happen, that of half a dozen patients accosting the Commissioners as they pass through the wards with complaints of being wrongfully confined, and that too in the most plausible manner, with every appearance of truth, there is matter for many days of patient and intelligent investigation, if this alleged safeguard is to be anything better than a flourish of rhetoric. One can scarcely think calmly of the fearful responsibility thus assumed, for in this class of the insane are to be found those whose bloody deeds, with a steadily increasing frequency, astonish and shock whole communities. Even admitting that a case of undue detention may be occasionally detected by this kind of visitation, a whole year may elapse before it comes to the Commissioners' notice. A considerable increase in the number of the members would relieve the difficulty in a small degree, but to this there is the potent objection of the expense, as well

as another made by Lord Shaftsbury, which we should have hardly expected. He says, in regard to such increase, " we should get into debates, and making motions and divisions, and ten thousand things of that sort."

The report of the Commissioners concerning this or that asylum is not calculated to impress us strongly with the value of their observations, occupied as they are chiefly with the smallest details of the service. We certainly are unable to see what great object is promoted by sending a gentleman to Land's End to ascertain that several of the women were very noisy, while one exhibited noisy tendencies and attempted an attack on the head attendant ; that the blankets were getting shabby ; that a few more cupboards are needed ; that an epileptic was found dead in her bed, and another woman died suddenly from cancer when no one was present ; that 18 men were " slops" on account of their faulty habits ; that a certain room would be improved by fresh paint and paper ; that a female suicidal patient, when out of the attendant's sight two or three minutes, nearly strangled herself with the cord of the window blind, etc.

And as for that great bugbear, so much used of late years to frighten a credulous public—that of sane people shut up in madhouses by means of foul conspiracies between relatives and doctors—we are not aware that the Lunacy Commission have ever detected a single instance of the kind.

We have dwelt longer on this part of the English system than its real importance may seem to warrant, and the reason is that attempts have been made to introduce it into this country. But were the objections to it far less serious than they are, the circumstances are so different as to prevent its suitable working here. In the organization of our hospitals, the general supervision is provided for in a board of directors, whose control is almost unlimited. They are, for the most part, men of good social status, able and willing to perform their allotted duty. They make frequent visits, when they communicate with the patients, notice the condition of the establishment within and without, learn its proceedings, look after its finances, and give counsel and help when required. If sometimes there is found on these boards a person who uses his position to serve some unworthy purpose, or gratify some bad feeling, it only indicates the average style of character which would be likely to appear, of course, in any Board of different shape. A lunacy commission would, undoubtedly, be composed of the same kind of men, with no more general intelligence, and no more knowledge of insanity or of the insane, so that nothing would be gained in that direction. If it is to be engrafted upon the present system as a sort of supplementary agency, it is impossible to conceive of any division of duties that would prevent collision and embarrassment. If, on the other hand, the Commission is to take the place of the present Boards, it must needs be a large one in such States as New York and Massachusetts, in order that it may accomplish any desirable purpose. This implies a large increase of expense, and this, at a time when the whole country is crying out against the burden imposed by the care of the insane, will scarcely find favour with tax-payers. And after all, we do not hesitate to say, no duty whatever could be imposed on such a Commission that would not be equally well performed by the existing Boards.

We trust the results of this Parliamentary inquiry will not be lost upon this country. The questions here are the same, and the movers in the agitation are of the same character. The path of true improvement lies not in the direction of additional legislation, but rather in so elevating

the moral sentiment of the community that it shall insist on having the insane and all receptacles for the insane—whether hospitals, poor-houses, or huge municipal establishments—managed in the spirit of the broadest and wisest humanity.   I. R.

ART. XVIII.—*Recent Contributions to the Study of Glaucoma.*
  1. *Ueber das Glaucom.* Von Dr. MAX KNIES, Gräfe's Archiv, xxii. 3; ib. xxiii. 2.
  2. *Die Ursache des Glaucoms.* Von Dr. ADOLPH WEBER, Gräfe's Archiv, xxiii. 1.
  3. *Therapeutique Oculaire.* Par L. DE WECKER, Paris, 1878.
  4. *On the Pathology of Increased Tension of the Globe.* By Dr. W. A. BRAILEY, Royal London Ophthalmic Hospital Reports, December, 1877.
  5. *On Glaucoma and Iridectomy.* By Dr. J. SCHNABEL, Knapp's Archives, vol. v. numbers 3 and 4.
  6. *Glaucoma Aphorisms.* By Prof. L. MAUTHNER, Knapp's Archives, vol. vii. 3 and 4.
  7. *Contributions to the Knowledge of Glaucoma.* By Prof. J. SCHNABEL, Knapp's Archives, vol. vii.

THAT complex of symptoms known under the name of Glaucoma was, until 1856, a "noli me tangere" in ophthalmic surgery, and its pathology a "terra incognita." Speculations in regard to its etiology and the seat of the prime pathological changes were, indeed, rife enough, but most of them were, at least, but plausible conjectures. It was referred by various authorities to each distinct anatomical division of the eye, by some to two or more. The larger number located the essential alterations in the lens or vitreous humour, probably on account of the greenish appearance the pupil presented in the majority of cases. Of its true character it is not known that they had any knowledge. It was reserved for Von Gräfe to point out at once its essential character and the means for its relief.[1]

But, although the essential nature of the affection is better understood since Gräfe threw the light of his genius on the subject, its etiology is almost as much a *questio vexata* as ever it was. The fact that we have a remedy for it has not by any means settled the question of its pathology, and, indeed, the manner in which iridectomy cures the disease (if it really be an entity) serves as the battle-ground on which the conflict of opposing theories is waged. A theory which does not satisfactorily explain the manner in which iridectomy lowers increased tension can have no chance of acceptance.

It must, however, by no means be understood that no important truths have been brought to light by this clashing of opinions. Indeed, many facts have been elicited which are destined to simplify further study, and will be of great value to the future investigator. Truth is only arrived at

[1] Platner (*Institut. Chirurg. Rational,* Leipsig, 1745) was probably the first who noted an increased hardness of the ball in glaucoma. He divided the glaucoma cases into two categories. In one the swelling of the lens caused a pressure on the other parts of the eye, increasing its tension ; in the other, the seat of the trouble was in the vitreous. Certainly hardness of the ball had not the same significance to him as to Gräfe.

by the elimination of a great deal of error, and before we come to the true pathology and etiology of glaucoma we shall have, no doubt, to abandon many ideas at present having general acceptance.   We should be careful, therefore, to hold our views in a plastic condition ready to take the form which the facts most clearly established warrant, but at the same time accepting it as only provisional.   The time for fixedness of ideas in respect to glaucoma has certainly not yet arrived.

Though the subject has attracted marked attention since men began to study human pathology, it has quite recently come forward with much greater prominence on account of the close and accurate examination of a number of glaucomatous eyes that have been removed for various causes. This is, it seems to us, the true beginning of a proper study of the question.   What we want in this stage of the investigation is *facts*.   We want to know as accurately as the microscope can tell us the exact anatomical condition of an eye that has become glaucomatous.   When we have accumulated a large number of observations of this kind, and have at the same time the full clinical history of the cases, we shall be prepared to form a rational pathology of the affection, and not till then.

The titles of some of the papers which have recently appeared treating the subject in this manner we have placed at the head of this paper, but this is far from being the total amount of the literature contributed to the subject during that time.   These are, however, sufficient to show how earnestly the field is being worked, and how much has really been accomplished.

Before entering into a study of these papers it may be well enough to refer briefly to the prominent theories that had been held respecting the pathology of glaucoma previously.   Ever since Gräfe observed that glaucoma was but another name for increased tension of the ball, pathologists have been mainly divided among three opinions, as to the conditions leading to this increase of tension.

The first is the one put forward by Gräfe himself, and has been designated as the *inflammatory* theory.   According to this, the basis of the increased pressure lay in a choroiditis serosa (irido-choroiditis), which caused a hypersecretion of fluid which, not being able to find an outlet, produced a distension of the walls of the globe.   All the phenomena—corneal opacity, dilatation of the pupil, excavation of the optic disk, were due to this increased pressure.   Those cases of nerve excavation unaccompanied by apparent increased pressure, and first designated by him as "Amaurosis with excavation," he finally came to look upon as glaucomatous, and considered that the pressure had been very slight, but of long continuance.   The *typical* form was the acute inflammatory.

On the other hand, Donders looked upon the *simple glaucoma*, which corresponds to Gräfe's "amaurosis with excavation," as the type, and regarded the inflammatory symptoms as intercurrent and as complications. He did not believe that a glaucomatous inflammation had ever been observed in an otherwise sound eye.   The cause of the increased quantity of fluid in the eye he considered to be deranged nervous influence, and hence his theory is known as the *neuro-pathic*.   The trigeminus he considered to be the nerve which presided over the secretory functions of the interior of the eye.   He did not consider the sympathetic to exercise any material influence.   The seat of the nervous lesion may be intra- or extraocular.

The other theory is known as the *scleral* theory, because the rigidity of

this tissue is looked upon as the principal factor in the morbid process. Hippel and Grünhagen thought that deranged nervous influence produced a thickening of the scleral tissue, which prevented it from yielding to pressure from within. Cusco, who was among the first (1862) to advocate this theory, thought the changes in the sclera due to inflammation. Coccius (1863) considered it due to a fatty degeneration of the tissue with subsequent shrinking. He also attributes some influence to hypersecretion of fluid. Adamück thought the inelasticity of sclera prevented the outflow of blood through the *venæ vorticosæ*. Stellwag (1870) looks upon the elasticity of the bulb as the regulator of the intra-ocular pressure. Should this become deranged, the pressure must be modified.

Even Gräfe finally (1869) came to regard the rigidity of the sclera as a factor in the production of simple glaucoma by the pressure it exerted on the secretory fibres of the nerves passing through it.

Dr. Max Knies was the first to make anything like an extended report of the conditions found in a number of glaucomatous eyes taken indiscriminately. The eyes examined by him were from the collection of Professor Becker, in Hiedelberg. He went into this examination without a prejudice for or against any particular glaucoma theory. The result of the microscopical appearances of each specimen is given in full, as well as the clinical history of the case, so far as it was obtainable.

In every specimen examined by him, there was found a closure of *Fontana's* space, either by the pushing forward and agglutination of the iris to the periphery of the anterior chamber, or by an inflammatory product. In the larger number of cases he regards the origin of the trouble to be an inflammation around the canal of *Schlemm*.

As *Fontana's* space plays a very important *rôle* in some of the more recent theories of glaucoma, it may be well to define what is meant by it. Parties are hardly agreed as to the exact extent of surface covered by the term; some limiting it to the "angle of the iris," while others make it embrace Schlemm's canal and the parts in its immediate vicinity. Fontana's space (Fontana himself regarded it as a canal) is not, indeed, to be found in the human eye. The network of loose connective tissue which he described in the eye of the ox, and which is met with in other lower animals, and in the Orang-Outang, is not found in that condition in the human eye, but is represented by the *ligamentum pectinatum*, or iris-angle, which by convention is limited to a portion of the periphery of the anterior chamber, which is bordered inwardly by the termination of the membrane of Descemet.

Schnabel defines its limits as follows: " If we imagine a cylinder erected in a normal eye, on the basis of a plane passing through the margin of Descemet's membrane, and its circumference coinciding with that margin, and if we suppose the surface of the cylinder to stand posteriorly to the plane of the iris, there remains between the surface of the cylinder and the lateral wall of the chamber an annular space, which is limited behind by the iris, in front by the ligamentum pectinatum."

Wecker says that this space (and that around the optic nerve) are "the only points in the interior of the eye which are devoid of a vitreous membrane which is badly adapted for filtration."

The inflammation around Schlemm's canal need not be pronounced to lead finally to the closure of Fontana's space. It is present, however, even in the non-inflammatory form. Cellular infiltration of this region was absent in none of the glaucomatous eyes examined by Knies. As the result of his examinations, he has come to the following conclusions:—

"1. The essential condition of genuine glaucoma is a gluing of the periphery of the iris to the cornea and an obliteration of Fontana's space. The nerve excavation is to be regarded as somewhat secondary.

"2. The same relations exist also for the so-called secondary glaucoma; only for secondary glaucoma after occlusion of the pupil is the question not yet settled.

"3. The glaucoma-operation [Iridectomy] cannot be supplanted by the ezerine or any other treatment.'

"4. Sclerotomy is an exception to this, since an excision of a piece of the iris is not essential. It can, where prolapsus of the iris is not to be feared, be substituted for iridectomy.   •

"5. The affinity of many glaucomatous processes to glaucoma is shown through corresponding pathologico-anatomical conditions.

"There may possibly be cases where other causes can produce the clinical appearances of glaucoma, but I have not met with them.''

In giving this theory a place in the classification, we would style it the inflammatory-mechanical theory, since it is the product of the inflammation which causes the mechanical obstruction to the outflow of the fluids in the eye, on which the increased pressure depends. He at the same time, however, recognizes a nervous influence, particularly for an "outburst" of the glaucomatous attack. All the symptoms—corneal turbidity, iridoplegia, paresis of accommodation, hyperæmia of scleral veins, etc.—he refers to the increased intraocular pressure.

Weber's theory is similar to that of Knies in this, that he recognizes an impeded outflow of the eye-fluid through Fontana's space. In respect, particularly, to the glaucomatous appearances called forth by intra-orbital and intra-ocular tumours, he thinks that the obstruction of Fontana's space is due to a pushing forward of the ciliary processes. A dislocation of the lens by pressing upon and closing up the space can have the same effect. The swelling of the ciliary processes is due to impeded outflow of blood through the *venæ vorticosæ*. According to him, the essence of glaucoma does not consist in an increase of pressure as such, but in the complete lack of self-checking at the time when the pressure has passed the medium degree.

Wecker claims to have been the first to formulate our ideas respecting the pathology of glaucoma, and to look upon it simply as a symptom which was "the expression of an interference of equilibrium between secretion and excretion, with an increase of the contents of the eye and its pressure."[1]

This increase of tension he considers due, not to an increase in the secretion of the eye-fluids, but to a hindrance in the excretion. He, therefore, takes his place among those accepting the mechanical theory; and, like most of these, he looks upon the region of Fontana's space as the principal "filtration way," and any cause obstructing this way as provocative of glaucoma.

In an eye properly "disposed" to an attack of glaucoma, very various and slight causes can cause an outbreak. He even admits that strong emotions by causing a turgescence of the bloodvessels of the eye can be the "last straw" to break the equilibrium between secretion and excretion, and when this is once broken, the increased internal pressure will of itself become a factor in closing up the filtration way, by a condensation of the trabecular tissue of the iris angle.

Schnabel contends that the increase of tension is due to a derangement in the nerves controlling secretion, and, moreover, looks upon the opacity

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[1] Archiv f. Oph. xxii. 4.

of the cornea, which others have referred to the pathological intra-ocular pressure, as the result of an infiltration of the cornea with fluid. The following are his words:—

"I believe that the occurrence of the opacity now under consideration is not due to a pathological accumulation of fixed elements in the cornea, but that it is dependent upon the secretion of a turbid fluid; and taking into consideration the course, which evidently shows a dependence of a disease of the nerves, I am forced to regard the periodical opacity of the cornea which we encounter in all the various forms of glaucoma, most frequently in the inflammatory variety, but also in eyes which are not the seat of glaucoma, with or without increase of tension, as a neurosis of the secretory nerves."

The largest number of glaucomatous eyes examined by one person are those reported by Dr. Brailey in his paper. He gives the microscopical appearances found in fifty-three eyes in which increased tension " had been at some time a symptom."

He divides his cases into two groups: A, in which the iris was the starting-point of the affection; and B, in which the morbid process had its seat in the ciliary body or choroid. He lays special stress upon the atrophic condition of the ciliary muscle which was found in forty-nine of the fifty-three cases. Even in those cases where the changes began in the iris, the ciliary muscle was in time affected with atrophy. This atrophy, however, he believes to be preceded by a condition of inflammation, since in the cases examined when in the early stages he found a marked increase in the number of the nuclei. He evidently considers the increase of tension to be due, in the first place, to an increased secretion, though, later on, a hindrance in excretion does most likely come into play.

We have certainly here diversity of opinion enough to warrant the conclusion that the question of glaucoma pathology is yet far from being settled. The great importance, however, of most of these communications, as we have said, consists in the fact that the opinions are based on actual observations, and must have their value in the summing up of the evidence for a final decision. Let us glance briefly at these different views, and see how far each is supported by facts having general acceptance.

The view of Knies that the increase of tension is due to an obstruction of filtration through Fontana's space, appears to be supported by the whole of his observations and the greater part of Brailey's. B. says he found peripheral adhesions of the iris in twenty-five cases of the twenty-eight of group A, and in twenty-two out of twenty-five cases of group B; but still he does not look upon this as the prime cause, since it was not present in all cases, and he can readily account for it by the increase of tension pushing the iris forward against the cornea, and in those cases where there is inflammatory adhesion, by the propagation of the inflammation from the ciliary body to the iris. But, when this adhesion is once formed, it can act as a very powerful obstacle to the filtration of fluid. According to his observations, the tissue of the iris is but ill adapted to transudation, as is evidenced in the bulging of the iris when there is a total posterior synechia. The increase of nuclei in the vicinity of Schlemm's canal, on which Knies lays so much stress as the starting-point of the inflammation that finally leads to an obliteration of Fontana's space, Brailey looks upon as simply secondary to " the inflamed base and anterior surface of the iris." Both Knies and Brailey found the choroid alone affected but in one or two cases. In one of Brailey's cases pathological alterations were found there only. It would then appear to be pretty thoroughly established that the choroid

is not the seat of the morbid processes causing an increase of intra-ocular tension, and the theories of Gräfe and Fuchs[1] are without any substantiation. Schnabel is very emphatic in his statement that in no case of glaucoma is there opacity of the vitreous. What has been mistaken for this is the infiltration of the cornea with the turbid fluid of which mention has been made. That the cornea and not the vitreous is the seat of the turbidity is proven by the fact that it is impossible to get the reflexes from the lens, which would not be the case if the vitreous were the seat of the opacity ; and as mentioned in the paragraph quoted above, he looks upon a neurosis of the secretory nerves as the cause. Moreover, that this closure of Fontana's space is not the essential cause of the increased tension is shown by those instances where there has been undoubted increase of tension and the iris angle has been perfectly free (Brailey), and in those other cases where there has been a closure of Fontana's space and no increase of tension (Schnabel).

Nevertheless, the weight of evidence seems to be in favour of an important rôle played by Fontana's space in the process of exosmosis of the intra-ocular fluid, though we are hardly justified in considering its closure as the sole cause of the phenomena of glaucoma. Schnabel has shown that in only few iridectomies is the iris angle freed, even when the operation is successful in dissipating the glaucoma symptoms.

It would, however, be easy to see how in an eye "properly prepared" for an outburst of glaucoma, a closure of Fontana's space would quickly destroy the equilibrium between secretion and excretion, and bring on an "attack."

Further observations are yet needed, but we are apparently in the right road of investigation, and in a matter of this kind that is a cause for congratulation.

From Brailey's cases it is most probable that the iris too takes a part in the morbid processes leading to increased tension. In his group A, the iris was either solely or primarily affected. It is well known that iritis serosa is commonly attended with plus tension, but it is a question as to whether this is due altogether to the increased secretion. In these cases there is a dilatation of the pupil, and it is not impossible that the peripheral portion of the iris may be crowded into Fontana's space, or that the ciliary processes may be pushed forward, as contended for by Weber, to occupy the iris-angle. In either case it is possible that "filtration" would be hindered. Those sudden outbreaks of glaucoma after instillation of atropia can be explained in this manner. Though Pagenstecher has often found the ciliary processes pushed backward and inward, instead of forward, it by no means follows that if they were crowded into Fontana's space, the outflow of fluid would not be hindered.

Schnabel seems to be the only recent writer who attaches prime importance to deranged nervous action as a cause of increased tension. Others acknowledge that it may play a part, but look upon it as secondary, or as a complication. The importance of the "nervous" factor in glaucoma cannot be estimated from the pathological appearances shown under the microscope; for this we must look to the clinical history of the cases. The intense pain, the sudden appearance and disappearance of some of the symptoms in many cases would seem to point to an implication of the nervous system. As is well known, an attack of glaucoma may occur suddenly, and pass away in a few hours. This, it seems to us, can be

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[1] Transactions Heidelberg Congress, 1878.

accounted for most rationally on the supposition of a deranged nervous
action. It will hardly be denied by any one, I think, that the secretions
of the eye are largely under the control of the nerves supplying it. There
are few cases of neuralgia of the trigeminus in which there is not congestion
of the conjunctival tissue and lachrymation. Many cases of "glaucoma
outburst" are on record, after strong mental excitement. It is a fact,
too, that women, whose nervous organization is in general more impressi-
ble than that of men, are most frequently subjects of glaucoma.

We think, then, that Schnabel has good grounds for his statement that
"the regulation of the conditions of secretion and absorption, the compen-
sation in cases of accidental disturbances belong to the domain of nervous
action, and a disturbance of this action must be looked upon as the cause
of the permanent increase of the vitreous humour in cases of glaucoma,
and of the permanent diminution of this fluid in cases of detachment of the
retina and essential phthisis." That the ciliary nerves have a controlling
influence on the secretion of the eye-fluids, or at least on tension, is de-
monstrated in cyclitis, where there is, almost without exception, minus
tension. That this minus tension is due to diminished secretion is ren-
dered probable by the fact that we can most reasonably exclude an increase
of excretion. From the amount of inflammatory matter thrown out, fre-
quently in Fontana's space itself, we would, on the contrary, naturally
suppose that filtration would be hindered. We have, however, diminished
tension, and as it stands in immediate relation with "deranged nervous
action" we can look upon them only as cause and effect.

It is an unfortunate fact, known but too well to operators, that an ope-
ration on one glaucomatous eye often brings on an attack in the other. It
would be hard to exclude the influence of the nervous system in these
cases. Possibly it may be the shock of the operation and the anxiety as
to the results; but it is not at all improbable that the influence is exerted
in a much more direct manner. In performing the iridectomy, section is
made of the ciliary nerves in a region where impressions are most likely
to be sympathetically felt in the fellow eye. Accepting, as I think the
history of glaucoma cases will amply warrant us in doing, a predisposition
on the part of the patient to a glaucomatous attack, we can readily see
how easily an irritation of the ciliary nerves of one eye could be conveyed,
by sympathy, to the other, causing a disorder in the secretion of the eye-
fluids, manifesting itself by a plus tension.

That rigidity of the sclera, either senile or as the result of disease, is
not the only true cause of glaucoma is proved by the fact that we have
glaucoma in persons not old enough to have rigid sclera from age, and in
whom a history of scleral disease is wanting.

Brailey's observations on the nerve excavation are of the utmost im-
portance, since they are at variance with our accepted symptomatology
and clinical history of glaucoma. We have always been taught to look
upon the cupping of the disk as the pathognomonic sign of glaucoma, and
since the normal tension of eyes varies so much, the condition of the nerve,
in doubtful cases, has been looked to to give us indications for interference.
In a disease where prompt action is so much demanded as in glaucoma, it
is a matter of deep regret that one of our most trusted symptoms is likely
to fail us.

Brailey has found, in his specimens, that the cupping of the disk "fol-
lows at some distance, in point of time, the increased tension, even where
this has been considerable." He says that in one case, with a history of

five months' continuous pressure of $+ 2$, the disk was not undermined at its edges. And in many cases where a pressure of $+ 1$ at excision had probably continued for seven or more years, the cup was neither deep nor undermined laterally. Schnabel accounts for the excavation by supposing some special alterations in its tissue. In fact the pathology of "cupped disk" is far from being clearly understood. In cases of glaucoma simplex, where the tension is so slightly increased as to be hardly perceptible, the excavation is frequently marked. Indeed it was a long time before Gräfe would agree to class his "amaurosis with excavation" under the head of glaucoma, and only did so finally under the supposition that more marked pressure had existed previously. That there is something in those cases which removes them from the category of the inflammatory form is rendered evident by the fact that iridectomy is not so certain in its curative effect. In many cases, indeed, vision fails very rapidly after the operation.

There is scarcely a limit to the length one might go in the discussion of these various theories respecting the different phenomena of glaucoma.

In glancing over the facts which section of enucleated eyes and the clinical history of cases have furnished, it seems to us clear that there is a quantity of truth in all the theories advanced. The trouble seems to be that each investigator has been looking for one single factor, when in reality there is no such thing.

It seems evident to us that if we would enter upon a study of the subject in a proper manner, and in one which would most surely lead to useful results, we must cease to regard glaucoma as a disease, and look upon it only as a *symptom*. Important practical results would, beyond doubt, flow from such a study of the subject. Gynæcologists no longer treat dysmenorrhœa as an entity, but as congestive, obstructive, etc., recognizing any number of distinct causes as likely to lead to that condition. So it does not seem unreasonable to suppose that the ophthalmologist of the future will treat glaucoma with reference to its various causes, and that eserine or other narcotic, iridectomy or sclerotomy, will be the therapeutic means employed in accordance with the differential diagnosis.

This leads us to the consideration of treatment, which has shared next to pathology the attention of recent investigators on the glaucoma question. On this point we shall have to be briefer than we should like, since our paper has already grown to an unexpected length. The demands of science are never satisfied. When it was found that we had in iridectomy a means of curing a hitherto incurable disease, the ophthalmological world was rejoiced. But when it was found that it did not reach all cases, attention was directed to other means, which either theory or experience led operators to hope would be efficacious.

The only operation which shares with iridectomy the honour of curing glaucoma is sclerotomy. Sclerotomy was recommended as long ago as 1830 by Mackenzie, but Stellwag was the first one (1868) who in recent times employed it in a rational manner. Although Wecker, in 1869, contended quite strongly for sclerotomy, he appears latterly to have lost somewhat of confidence in it, for reasons which are not very clear. He says : " It is probable that during the rest of my professional career I shall continue to make by preference an excision of the iris as being the operation the most certain against glaucoma. I have, however, the conviction that as science progresses there will be substituted another procedure simpler and more logical."

Mauthner is in favour of abandoning the excision of the iris altogether,

and that, too, not on account of any theoretical reasons, but because experience has taught him it is not only unnecessary, but absolutely harmful. He says : " When I come forward as a defender of sclerotomy, my position is easily tenable, for in so doing I do not defend any theory.   I understand the action of iridectomy just as little as that of sclerotomy.   I know just as little of the cause of glaucoma as the foundation of its operative cure, and if any one were to recommend to me to-day any new operation as—*cum grano salis*—a cure for glaucoma, I should not doubt the *possibility* of the affair."

One of the gravest charges he brings against the iridectomy is on optical grounds. The coloboma, he says, is the cause of such indistinctness of the retinal images as in many cases to bring the visual power of the eye *below* what it was before the operation.   That it is due to the coloboma is shown by the fact that when the coloboma is covered V. rises.   A second grave charge is that in some unexplained way the operation exerts an unfavourable influence on the disease of the nervous apparatus.   I remember to have heard Wecker make the same statement verbally.   He has seen so many cases of simple glaucoma get rapidly worse after the iridectomy, that he was forced to think the section of the iris exercised a pernicious influence on the nutrition of the nerve, and in such cases he always advised against iridectomy.   What his results in such cases are with sclerotomy I do not know.   Mauthner gives minute directions as to the manner he would have the sclerotomy performed ; for these, however, we are forced to refer the reader to the original article.   Schnabel, believing that the section of the iris acts in the same way as a neurotomy in neuralgia, of course looks upon the iridectomy as the important part of the operation.

Some two years ago Prof. Laqueur, of Strasburg, reasoning *a priori*, discovered the anti-glaucomatous effect of eserine, the active principle of the Calabar bean.   Experience has fully demonstrated the efficacy of the remedy in certain cases, and so marked have been the results of its employment in some instances that a surgeon is hardly warranted in resorting to operative procedures without having first given eserine a trial.   It would appear, however, from the knowledge thus far gained that it is most likely to be beneficial in acute glaucoma.   In the chronic form we are not likely to derive much benefit from its use.

Weighing then as carefully as possible the facts as we have found them in respect to treatment, we are warranted, I repeat, in arriving at the conclusion that in—let us hope the near—future the treatment of glaucoma, will not be a mere routine mutilating of the iris, but that iridectomy, sclerotomy, or eserine, or other means not yet discovered, will be applied rationally and in accordance with a well-understood etiology of the affection.   S. M. B.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

Art. XIX.—*Medico-Chirurgical Transactions.* Published by the Royal Medical and Chirurgical Society of London. Second series. Volume the Forty-third. 8vo. pp. lxviii., 324. London: Longmans, Green, Reader, and Dyer, 1878.

As abstracts of many of the papers contained in this volume have already appeared either in previous numbers of this Journal or in the *Monthly Abstract of Medical Science*, which reaches most of our readers, we shall call attention in the present notice only to the remaining papers.

The first of these is a report of *A Case of Noma, in which moving bodies were observed in the blood during life*, and is contributed by Dr. Arthur Ernest Sansom. The examination of the blood in this case led to the discovery of organisms which Dr. Sansom believes have not been previously described. These organisms appeared under the microscope as highly refractile bodies, endowed with powers of rapid locomotion. On account of such motion their exact shape was difficult to determine; but when comparatively still, and a little out of focus, each one refracted light in such a manner that a small bright cross was visible in its substance. Thus they resembled crystals of oxalate of lime, with the exception that they were not perfect octahedra, but appeared as fragmentary crystalloids. The addition of a two per cent. solution of carbolic acid to the blood caused the movements of these bodies to cease, while that of dilute solutions of potash or sulphuric acid stimulated them. The latter effect was produced by heat, and they were found in the blood in the greatest number during periods of the most intense fever. Inoculation of the blood upon the lower animals produced septicæmia, with the manifestation of similar motile particles. They were also found in the urine. On the other hand, inoculation of the fluids derived from the diseased tissue, induced only peritonitis, without discoverable alteration of the blood.

Mr. Morrant Baker reports a case of *Removal by Operation of a Large Hairy Mole occupying half of the Forehead*, occurring in a healthy and well-developed girl of ten years of age. The integument composing it was deeply pigmented, being of a dark, blackish-brown tint, with a very uneven surface, especially below and to the left, where it was mammillated or almost warty. A quantity of coarse hairs grew from nearly every part of the surface, being thickly planted, as in the case of the hairy scalp, and many of them an inch or two in length. The operator thus describes his method of procedure:—

" I began the treatment," he says, " after the patient was put under the influence of chloroform, by cutting off a small portion of the surface of the mole as smoothly as possible with a sharp scalpel; taking care, while cutting away both the epidermis and corium, not to remove the whole thickness of the latter, in order that the subcutaneous tissue might be left untouched, and thus such contraction as is apt to follow its destruction might be prevented. Free but not excessive bleeding occurred from every part of the cut surface. It was controlled easily by a pad and bandage. Two days afterwards the dressing was removed, and the surface allowed to form a scab, which was not touched for several days."

The remainder of the mole was removed about a month later, and the wound left to heal by itself under a scab in precisely the same way as before. In less than a month after the second operation the wound was almost completely healed. The scar was smooth and not pigmented, but hairs had begun to crop up again pretty freely from its surface. As it was evident that the skin must be destroyed to a greater depth in order to get rid of the larger hair follicles, Mr. Baker applied nitric acid to the surface in the hope that the liquid caustic might find its way into the hair follicles, and thus affect, to a slightly deeper level than the general surface of the integument, those structures which he desired to attack. After several applications of the acid the mole had almost entirely disappeared, the only traces of its presence being a tiny patch here and there of deeply pigmented skin, with a very few fine hairs, almost imperceptible except on close inspection, growing from it. In conclusion he says:—

" The scar tissue is now smooth, whitish, glazed, and supple; quite level with the adjoining healthy integument, and not in the least degree contracted, or dragging in the least on neighbouring parts."

In a report of *The Microscopic Anatomy of the Smooth Tongue* (Chronic Superficial Glossitis), Mr. HENRY TRENTHAM BUTLIN points out the fact that the disease presents many points of resemblance both to psoriasis and to ichthyosis of the tongue. Expressed shortly, the changes which he observed consisted in thinning of the epidermis, with destruction of the papillæ and other appendages; in thickening and increased vascularity of the corium, and infiltration of its superficial layers with nuclei or cells. The disease producing these changes appears to be a chronic inflammation of the mucous membrane, which has gradually produced complete alteration in the characters of the epidermis and thickening of the corium and submucous tissue. The surface of the tongue is not reduced to the condition of mere "cicatricial tissue," as described by Mr. Fairlie Clarke, for some of the chief characteristics of this tissue are absent.

Dr. WILLIAM M. ORD proposes to apply the term *Myxœdema* to the cretinoid affection originally described by Sir William Gull, in the *Transactions of the Clinical Society of London*, vol. vii.[1] In a case which terminated fatally he found the œdematous condition of the skin to depend upon an enormous increase of the "normal mucin-yielding inter-fibrillar cement," and not upon the presence of serum, as he had at first supposed. When subjected to chemical examination portions of skin derived from his patient's body yielded fifty times as much mucin as could be extracted from similar portions of skin taken from other bodies, whether œdematous or not. The apparent œdema of the cretinoid affection is unaffected by pressure or change of attitude, and is well marked in the face; more so at first than in the lower extremities. The skin retains its œdematous condition even when cut up into small fragments; whereas the skin of dropsical patients collapses when so treated. In addition to this appearance of the skin, the arteries were everywhere thickened, the larger were atheromatous, and there was firm, almost solid œdema in many parts—*e. g.*, in heart, soft palate, larynx, stomach, and neck of bladder. The brain, also, showed very considerable degeneration of the large arteries. In the coats of the arteries the adventitia was often swollen to three or four times its proper proportions, with the fibrils well defined, as though separated from each other by a swollen interstitial substance. In the kidneys a similar thickening, growing inwards from the capsules of the Malpighian bodies, could be seen encroaching in various degrees up to obliteration upon the contained glomeruli of capillaries; and in the liver an enormously disproportionately swollen connective tissue separated the cells from one another,

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[1] See number of this Journal for July, 1875.

and evidently encroached on them, and tended to produce atrophy in them. In the thyroid gland the alveoli were compressed and mostly annihilated by a growth of the same kind; and in the muscular tissues, particularly in the heart, the same sort of excess of cement was clearly recognized.

Dr. Ord is of opinion that the symptoms of the so-called cretinoid state can be explained by regarding them "as effects of this jelly-like swelling of the connective tissue, chiefly if not entirely consisting in an overgrowth of the mucus yielding cement by which the fibres of the white element are held together." Accordingly he proposes to call it myxœdema.

In regard to the way in which he thinks the symptoms are produced we will let him speak for himself.

"I would argue," he says, "that the most important mode of operation by which this condition produces the symptoms associated with it is the padding of the peripheric termination of the sensory nerves, and perhaps, too, of the muscular nerves, with a soft material which hinders their free reception of impressions. That perception becoming slower than usual, and the central nervous system losing through the altered state of the skin its natural and necessary stimulation, a state of intellectual lethargy and slowness in coördination of movements are necessary consequences. In this chain slow use, partial disuse, and numbness of faculties are links of one kind, and the constant retardation of guiding sensory impulses a link of another; so that supposing the myxœdema to be constant the nervous degradation tends to be progressive. The train of symptoms leading to the fatal termination commences in the encroachments of the myxosis upon vessels and upon the secreting elements of glandular structures."

Just before the close of the two fatal cases the author reports in his paper, albuminuria was added to the other symptoms, showing the extension of the disease to the kidneys.

In his paper *On the Proportion of Red Corpuscles in the Blood, in some skin diseases*, Dr. GEORGE THIN arrives at results which we were scarcely prepared for. The only cases of skin disease in which he found the corpuscular element of the blood deficient were a case of pemphigus and one of prurigo. On the other hand the number of corpuscles was normal in the cases of psoriasis, eczema, and leprosy, which he examined. The table appended to the paper shows the number of red blood-corpuscles per millimetre cube in seventeen cases of various forms of skin disease.

A second paper, by Dr. THIN, is *On the Condition of the Skin in Tinea Tonsurans*, in which he takes ground with Küchenmeister, as against Kaposi, that the parasite in this disease is only found among lifeless epidemic products, and does not exist amongst those which still retain even the smallest degree of organic life. In order thoroughly to study the condition of the skin, sections obtained from a mare affected with the disease were examined microscopically, and with the following results:—

"The spores of the tricophyton tonsurans are found," he says, "in and immediately surrounding the hair shaft, and plentifully between the latter and the internal root sheath. In this position they travel downwards from the free surface of the skin, along the hair shaft, to a considerable depth; but in no instance did I, in my sections, find them reach to the hair papilla. They travel deeper than the level of the sebaceous glands. Not only do they not extend laterally to the external root sheath, but they do not penetrate the internal root sheath, and they are never found in the substance or openings of the sebaceous glands. On the surface of the skin they are only found amongst the most superficial scales of the epidermis. The parts of the hair with which the spores are found in contact are thus analagous to the superficial epidermic scales of the horny layer of the epidermis."

In regard to treatment the author says, that next to carefully-performed epila-

tion the best treatment is to use an application that will keep up a slight degree of congestion of the affected skin over a considerable period. This gives rise to a persistent effusion of serum, which penetrates the hair sheaths, and bathes unceasingly the spores that surround and infiltrate the hairs, and which finally acts destructively on the fungus. Between the vegetable parasite and the living fluids of the body there is no *modus vivendi*.

In a *Second Communication on Simple Atrophic Sclerema*, Dr. JOHN HARLEY completes the history of the case of this disease which he reported in the previous volume of these Transactions. The patient died in consequence of an attack of diarrhœa. At the autopsy the sclerema and stiffness of the wrists and finger-joints had completely passed away, and there was no extraordinary lividity of the now soft and emaciated fingers. There was no trace of œdema anywhere, the skin was thin and supple, and almost every trace of fat had disappeared. The liver, kidneys, suprarenal bodies, spleen, mesenteric glands, pancreas, and the alimentary canal were all healthy. There were pericardial adhesions and some dilatation of the right ventricle. Excepting the diaphragmatic surfaces, the lungs were everywhere adherent, and so firmly adherent that only a portion of the antero-lateral surface of the right could be separated without laceration. The author seems to regard this condition of the pleural membranes as the cause of the sclerema, for he says : "That it is an interesting fact that the condition above described as simple atrophic sclerema may be one of the results of general pleurisy." He does not, however, attempt to explain the connection which he believes exists between these two morbid states.

Dr. LAIDLAW PURVES is the author of a report on *One Hundred Cases of Paracentesis of the Tympanic Membrane*, which contains remarks on the methods of operations and the results obtained therefrom. The method which he prefers to all others is Voltolini's with the galvano-cautery. The following is the procedure which he recommends :—

" Having," he says, " ascertained by perosseal audition, that the acoustic is fairly healthy, the hearing power is determined by the watch. A preliminary puncture is then made by means of a broad needle, and while the opening gapes and is still unaffected by the congestion arising from the irritation, the hearing power is again ascertained. If it has improved, the galvano-cautery, if ready, may be at once applied to the spot, and the opening made as desired. . . . The opening having been made by the cautery, a pad of wadding smeared with mercurial or simple ointment, or the glycerine extract of pancreatine, is pressed against the drum, so as to expand it as much as possible, and left there for two days. The wadding is removed every second day, the parts washed with warm water and carbolic acid solution, the drum drawn outwards by means of the vacuum speculum, for the purpose of preventing any adhesions forming, and the wadding again applied."

The general results are stated as follows : Of 8 cases in which paracentesis was performed on account of tinnitus, 2 were benefited, 5 were not improved, and in 1 the result is not given ; of 6 cases of nervous deafness, not one was improved ; of 39 cases of cataractous drums, 23 were benefited, 12 were not, 3 were doubtfully improved, and in 1 the result is not given ; of 7 cases of relaxed membranes, paracentesis improved 5, the remaining 2 were not improved. In 21 cases in which the perforation was made for the removal of fluids or solids from the cavity, 15 were benefited, 5 were not, and in 1 the result is not given. In some cases, especially among those of cataractous drums, the benefit derived from the operation was so great that it was repeated several times at the request of the patient. The cases are arranged in tabular form for convenience of study.

In the course of his article *On Some Points in the Minute Anatomy of the Kidney*, Dr. REGINALD SOUTHEY refers to Henle's discovery of the " down

looping" tubes in the bundles of straight tubes which compose the substance of the medullary rays of the kidneys, and attaches some importance to them in relation to the pathological phenomenon of tubular casts. They are much smaller in calibre than either the straight tubes of the cones, or the tortuous tubes of the cortex. "If," he says, "casts or plugs collect in the tortuous tubes, their passage onwards and outwards must be slow and laborious, and to be effected only through some gradual dilatation of the narrow looping passages. Further, such casts, by distending the down looping tubes upon their passage outwards, must seriously disturb or obstruct the circulation through the vasa recta."

It is only fragmentary débris and fatty globules, which, in his opinion, travel down from the tortuous into the excretory tubes; and even in advanced renal disease, it is remarkable how free from plugging and degeneration these downloopers usually remain, a circumstance which could scarcely happen if much solid material ever passed through them. All casts found in the urine, he therefore thinks, derive their form from the excretory system of urine tubes. The chemistry of their substance may be vaguely described as "some colloid." Two qualities of colloid may, however, for clinical purposes, be distinguished, the one derived from the upper glandular portions of the renal tubes, an abnormal secretion from its glandular cells, giving a yellow, waxy look, and highly refracting features to the cylinders formed of it, the other a fibrino- or albumino-plastic colloid, essentially whiter and more transparent than the former, derived from the setting of blood plasma which has transuded into the tubuli from the bloodvessels at a lower part of their course. The author does not pretend to be able to state that a particular cell-form seen in a cast has been derived from a tortuous or an excretory tube; the only cell-forms which he recognizes being leucocytes, white or red blood-cells.

Mr. HUTCHINSON communicates some observations *On Paralysis of the Internal Muscles of the Eye*, which is accompanied by symptoms which indicate, in his opinion, disease of the lenticular ganglion. The symptoms which we would expect from destruction of the lenticular ganglion, receiving, as it does, branches from the third, the fifth, and the vaso-motor nerve, are iridoplegia or paralysis of the iris, both as to its circular and radiating fibres, and cyclo-plegia or paralysis of the ciliary muscle. The author holds that when this triad of symptoms is present without any other form of orbital paralysis, the seat of the disease can be in no other structure than the ganglion itself. If, however, any of the recti muscles are affected also, the disease must be seated further back—either in the trunk of the third or sixth nerve; and if only one or two of the separate symptoms forming the triple group were present, the inference would be ready that the disease might be seated either in front of the ganglion, or behind it in the trunk of the nerve involved.

Mr. Hutchinson reports 7 cases, to show that this precise group of symptoms, to which he proposes to give the name Ophthalmoplegia Interna, is occasionally met with. In 4 of these cases there was a distinct history of syphilis, which he regards as tolerably conclusive evidence that it is possible for syphilis to attack and disorganize the separate ganglia connected with the vaso-motor system.

A tabular statement of 8 cases, which have come under the author's observation, is appended to the paper.

Dr. REGINALD E. THOMPSON gives the result of his observations *On the Pathological Traces of Pulmonary Hemorrhage*, in an interesting paper, in which he refers to the surprising fact that notwithstanding the frequency of hæmoptysis, there is a remarkable paucity of pathological proof of its effects upon the lungs, the question having been studied almost exclusively from its clinical aspect. If the lungs be examined shortly after a hemorrhage, numerous round, well defined,

and circumscribed nodules are found, differing in these respects from pneumonic products, which are, the author says, of irregular shape, and generally shade off into the tissue near.   The tissue in the surrounding region shows marked evidence of irritation, the result being similar to that which obtains in the irritation of pulmonary catarrh, with general thickening and increase of the connective tissue elements.   On examining the section with a lens, small elevated nodules may be found, which, on further examination, prove to be solitary alveoli or bronchioles, plugged with blood-globules firmly packed into the lumina, and in some cases distending them.   The nodules themselves show a strong tendency to drag away from the surrounding tissue, and either undergo a gradual process of erosion, or a general liquefaction, which involves the whole mass equally.   In either case, however, the hemorrhage may result in excavation of the lungs, or, in other words, give rise to a phthisis ab hæmoptoe.   With regard to the possibility of an infection of secondary tubercle following upon this hemorrhagic condition, the author expresses himself as follows:—

" If simply the presence of secondary tubercle is looked for, it might be admitted that it may occur as an ultimate result of such disease, but if the question be asked in this form, namely, whether the secondary tubercle arises simply from the blood products, then the answer must be, that up to this time no case has presented itself in which the blood product has not undergone a secondary process, and that it requires more evidence to determine this point in a satisfactory manner."

The author has also found, as an occasional result of capillary hemorrhage with laceration of the pulmonary tissue, calcareous masses, sometimes of considerable size.

In his *Notes on the Spirillium Fever of Bombay*, 1877, Dr. H. VANDYKE CARTER, of H. I. M. Indian Army, takes the ground that the fever is really identical with relapsing fever, and he certainly succeeds in showing that there are many points of similarity between the two diseases.   The rate of mortality in the former, ten per cent., is much higher, however, than that of ordinary epidemics of the latter, which Dr. Murchison gives as 4.75 per cent.   The author lays great stress upon the occurrence in the blood, in both diseases, of a peculiar organism, the spirillium, or, more properly, spirochaete.   This parasite is not found, he says, in any form of malarial fever, typhoid, or, in fact, in any other disease except relapsing fever.   He describes it as—

" A colourless, homogeneous, and very delicate spirally-twisted filament, which during life is in constant motion amidst the *liquor sanguinis*.   The spiral or corkscrew twist is regular, and best seen when the organism is quiescent, or after its death; whilst during active movement it becomes undone, and may almost disappear, the filament meantime gaining in apparent length."

<div align="right">J. H. H.</div>

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ART. XX.—*Saint Bartholomew's Hospital Reports.*   Vol. XIV.   London: Smith, Elder & Co., 1878.

VOLUME XIV. of these well-known reports, though larger than many of its predecessors, hardly sustains the reputation for originality and thoroughness which has hitherto so generally characterized its contributions.

It opens with an able statistical article by REGINALD SOUTHEY, M.D., entitled *Observations on Acute Rheumatism;* a paper which brings us back to the ideal contribution to a "Hospital Report."   It contains a great many points of

interest and importance, only a few of which, however, we will be able to notice.

First, alluding to the season of greatest prevalence of acute rheumatism, we are prepared to find the greatest number of cases occurring in the winter months, though if we attributed at all the occurrence of acute rheumatism to cold and dampness, we would hardly expect to find the next greater number of cases occurring in the summer months; (spring 15, summer 33, autumn 24, winter 39), a condition opposed to the statistics collected by all other authorities (Senator). Though, as Dr. Southey candidly allows, his figures are hardly yet extensive enough to permit of definite conclusions on this point.

The relative mortality at different ages is then considered, the author placing, in 4908 cases, the mortality below 10 years of age at 3.40 per cent.; between 10 and 15 years at 1.5 per cent.; between 15 and 25 at 1.4 per cent.; between 25 and 35 at .9 per cent.; between 35 and 45 at .8 per cent.; while above 45 it stands at .4 per cent.; thus showing a gradual decrease in fatality from infancy to old age. In 3552 cases of acute rheumatism, cardiac complications occurred in 29.8 per cent.

Acute rheumatism the author describes as divisible into two forms: the acute continued and the acute relapsing; both are diseases of youth and early manhood, rather than childhood, middle or old age. The acute continued form usually attacks the muscular and robust; there is seldom any remission of pain or fever, except from the action of sedatives, before the eighth or ninth day; the temperature pretty steadily remains at 101.5°–102° (barring pericarditis). The inflammation suddenly subsides and defervescence gradually occurs, the patient being able to be about on the twenty-first day, though there is no tendency to a fixed crisis. This form is more apt to be complicated by pericarditis and pneumonia.

The subjects of the relapsing form are apt to be weak and anæmic. A striking peculiarity is that when once in bed, their pains diminish, and the disease seems rapidly to subside under every treatment, the temperature being usually reduced to normal by the seventh day. Usually again on the third day the inflammation and fever return, and may last a week, defervescence usually being complete by the fourteenth day. This may again be succeeded by a second, third, or fourth relapse, each relapse tending to be more severe than the original attack, while few of the cases which have had two attacks fail to present cardiac murmurs and permanent valvular lesions; endocarditis being the most frequent complication in this form. As regards the diagnosis of these forms at the outset, Dr. Southey states that the involvement of three or more joints simultaneously and the shifting of the local pain and inflammation rapidly is apt to indicate the acute continued form; while the relapsing form at the outset is apt to present inflammation of fewer joints, with less reddening of the surface and tenderness on handling, while the swelling is really more within than outside the joints.

The author next sought for the influence of the type of invasion, whether sudden or gradual, on the severity of the disease, and now again he has not felt in a position to speak with positiveness.

His conclusions are, however, that cases of acute invasion are more numerous; that pericarditis is more apt to occur in a case which began suddenly, but cases of retarded invasion are not necessarily exempt, while proportionately more relapses and certainly more serious relapses and more endocarditis are attached to cases which commence gradually and insidiously. Then again, "A highest temperature attained upon the 8th day of the disease usually indicates the acute continued form of rheumatic fever with its ordinary attendant pericarditis; and if the temperature falls gradually upon the 9th, 10th, and 11th day by gradual defervescence, the convalescence may generally be predicted to be complete and continuous."

"If remission to a normal temperature takes place on the 7th day, the probability of a relapse is considerable ; if on the 12th day, recovery is uniform ; if on the 14th day, about a third of the cases have a relapse." Then as to the probability of relapse inferred from the mode of defervescence, we find that in proportion to the rapidity of the defervescence is the tendency to relapse. Proportionately, more cases relapse in winter than in other seasons. These modifications of the course of the disease are claimed to be little modified by treatment, a statement apparently warranted by the fact of their deduction from cases subjected to such diverging lines of treatment as instanced in Table XI. Large doses of quinia given in the intermission, he states that he has recently noticed, seem "to obviate relapses or to reduce their length and severity in no small degree," while salicylate of soda in full doses lowers the pulse, reduces the temperature, and relieves the articular pains.

Following this paper is a rather unsatisfactory report of twenty-five cases of *Cervical Opisthotonos of Infants*, by Drs. GEE and BARLOW. The distinction of this from other forms of meningitis appears to be based on the fact that retraction of the head existed in every case, though the histories of the cases in nearly all instances are the merest outlines, and post-mortem examination was made in only five cases, and then very imperfectly.

The next article is by Dr. J. WICKHAM LEGG, on *Varieties of Icterus Gravis*, particular stress being laid upon the points of striking similarity in the symptoms and morbid anatomy of idiopathic icterus gravis, and the conditions caused by various poisons, more particularly by phosphorus.

Dr. CHARLES JEWEL EVANS, in the following contribution, furnishes a *Report of over Four Hundred Cases of Scarlatina*, which occurred in his practice during five years. Several points of interest are illustrated in his paper, among which may be mentioned the confirmation of the usually accepted observation that dropsy is more apt to complicate the mild cases, and also several cases in which the dropsy preceded the appearance of the rash. He also mentions rheumatism as complicating the convalescence of a considerable number of cases.

Dr. J. MATTHEWS DUNCAN reports a case of *Fibrous Tumour of the Uterus, Complicated with Inversion*, in which the tumour was removed by enucleation, and reduction of the inverted uterus accomplished, after three failures, three months after the removal by pressure kept up on the fundus for seventy-two hours ; the reducing agent being a straight stemmed repositor, the cupped end being applied to the fundus, and constant pressure secured by attaching the other end by India-rubber straps to the horizontal limbs of an ordinary T bandage. The reduction of the uterus was marked by severe pain, sickness, and numbness and pain in left leg. Three weeks afterwards she left the hospital feeling in good spirits, though suffering from pain in the back, with occasional attacks of sickness. Three weeks after leaving the hospital her death was reported, her previous symptoms having been anorexia and constant vomiting, œdema of both feet and left leg, rigors and fluctuation of abdomen. Dr. Duncan states that "there appears to be good reason to believe that the death was the termination of the morbid conditions, a part of whose history is given in this report. Probably extreme anæmia was the chief element in the causation of the fatal event."

Under the title of *Cases from the Throat Department*, Dr. F. DE HAVILAND HALL has reported nine cases, some of which are interesting ; among which may be mentioned the development of a small sessile growth on the arytenoid commissure during specific treatment. It is then some months later reported to have disappeared, but it does not appear as to whether it was destroyed by local applications, removed, or disappeared under general treatment. There is also a report of a case of apparent tracheal stenosis, to which no cause could be assigned,

though thoracic aneurism was carefully looked for. No mention is made as to the possibility of enlarged tracheal or mediastinal glands.

The next article is a *Report of Forty Cases of Rheumatic Fever*, by SAMUEL WEST, M.D., in which, among other points, he places the percentage of cardiac complications in first attacks at 50 per cent., and at 66 per cent. of subsequent attacks ; a percentage so much above that ordinarily observed that we think the discrepancy must be attributed in this instance to the small number of cases observed (16 first attacks, 21 subsequent attacks). He also calls attention to acute dilatation of the right ventricle occurring in the course of acute rheumatism, an occurrence which he attributes to organic change in the muscular tissue.

Following this report there is an account, by the same author, of an interesting case of *Paraplegia with Sacral Decubitus* (which latter term seems rather a senseless affectation), whose pathology, as discovered by autopsy, is described as follows : " In a patient with chronic inflammation of the lungs and bronchiectasis, one of the dilated bronchi lay so close to the surface as to lead to a considerable thickening of the pleura over it. Through these adhesions the inflammation propagated itself to the ribs, where it set up caries, and led to the formation of an abscess. From this abscess the pus travelled along the course of the nerves towards the spinal column, entered the spinal canal through the intestinal foramina, and led to suppurative inflammation of the post-meningeal tissue. An abscess formed here which produced by pressure acute softening of the spinal cord a short distance lower down," which latter lesion was associated with trophic disturbance, *i. e.*, a bed-sore, and ulcers in the bladder and urethra.

As a simple method of determining in an autopsy the *competency of the mitral and tricuspid valves*, Dr. LAUDER BRUNTON recommends the passage of the nozzle of an ordinary enema syringe, one with a shield at about half an inch from one end being preferred, through the auriculo-ventricular opening, and then forcing it through the walls of the ventricle until it projects at the apex. It is then pulled nearly through, and kept in position by a strong rubber ring. The competency of the valves can then be determined by injecting water through the nozzle into the ventricles, escape through the aorta and pulmonary artery being prevented by compression.

We should think that a simpler method would be to insert the nozzle into the ventricles through the aortic or pulmonary opening after the efficiency of those valves had been determined, the escape being prevented by compressing the arterial walls around the nozzle.

Some observations on the *Action of Pilocarpine* are recorded by W. E. STEAVENSON. He states that he employed hypodermic injections of one-sixth of pilocarpine, daily, in three cases of Bright's disease, one being acute nephritis after scarlet fever, and did not observe the slightest benefit following its use in any case ; in no case did the quantity of albumen diminish, but actually increased. The first few injections caused profuse perspiration, which diminished as the injections were repeated.

A Case of Intra-Thoracic Tumour is reported by Dr. W. S. CHURCH, and *Cases of Disease of the Spinal Cord*, by J. A. ORMEROD, M.D., which we regret our space will not permit us to notice.

There is also a paper by Dr. V. D. HARRIS, on the *Diagnosis and Treatment of Apparent Drunkenness*.				R. M. S.

Of the surgical papers in the volume, the first is a short article on *Indurations of the Breast becoming Cancerous*, by Sir JAMES PAGET, in which he states that the signs to be most relied upon in deciding that mammary indurations are not likely to become cancerous are, first, that there is less hardness, and a sensa-

tion of toughness rather than of hardness in the non-malignant indurations ; secondly, that they are also less rounded, less nodular, less well defined, more apt to be multiple than cancerous masses, and do not invade, infiltrate, or pucker the skin overlying them. He lays great stress upon this last point, and believes that when the nipple or any part of the skin of the breast is drawn into a subjacent hardness, it is almost certainly cancerous. In the treatment of mere indurations he recommends liquor potassæ in drachm doses, alone or combined with iodide of potassium. If this treatment is ineffectual, removal is to be undertaken, especially if there be doubt in the diagnosis, or reason to fear that the nodule may become cancerous.

A paper on *Compound Fractures of the Lower Jaw* is only worthy of mention because of an illustration showing the application of Hammond's interdental wire splint.

The best surgical articles in the book are : *Complete Intra-peritoneal Ligature of the Pedicle in Ovariotomy*, by ALBAN DORAN ; *Seven Years of Hospital Practice*, by Mr. CALLENDER ; *Commencing Cataract ; its Symptoms and Treatment*, by Mr. VERNON ; and *Note on the Treatment of Angular Disease of the Spine by Sayre's Plaster of Paris Jacket*, by Mr. WILLETT.

The first mentioned is a continuation of a similar article in last year's report, and presents the post-mortem appearances found after intra-peritoneal ligature and closure of the abdominal wound, in ten cases that died after being operated on by various surgeons in the Samaritan Hospital. He summarizes about as follows : In the series but a small minority were cases of death evidently due to complete intra-peritoneal ligature, and in all of the cases old standing disease of the thoracic or abdominal viscera was found. The presence of a cap of firm coagulum upon the end of the pedicle is favourable, because it indicates that the ligatures have not been tied so firmly as to cause sloughing, yet have been drawn tightly enough to prevent dangerous hemorrhage. The pedicle may partially slough in cases where there is fair reason to suppose that the unfavourable change is due to the ligature being pulled so tightly as to cause sloughing, before certain well-known salutary changes can save the stump of the pedicle. Hence, it follows that it is much more dangerous to draw the ligatures a little too firmly than to leave them somewhat looser than is strictly advisable. He considers the intra-peritoneal ligature preferable to the clamp, because there is no dragging of the uterus up towards the abdominal wound ; and he thinks these post-mortem notes show that the fatal result was seldom, if ever, due to the method of securing the pedicle.

Mr. Callender in his paper states that there has not been a surgical case of pyæmia in his wards during the last five years ; he attributes this immunity to the careful treatment of wounds, to cleanliness, and above all to thorough drainage. It must be remembered in this connection that Mr. Callender does not use the antiseptic spray and gauze in the treatment of his cases, but employs lint saturated with carbolized oil, which is laid upon the wound after the latter has been thoroughly cleansed with carbolized water. The inner layer of lint is re-oiled when necessary, but allowed to remain as long as possible without removal. An interesting portion of his article discusses the question of the asymmetry of normal lower extremities, and gives a table of the twenty-five patients whom he measured ; he found in almost every instance the legs of equal length. His results differ from those obtained by observers who have studied the subject in the United States, in which the occurrence of differences in length has been the rule rather than the exception. Besides the results obtained clinically, the measurements of the osseous skeleton made by Roberts (*American Journ. Med. Sciences*, Oct. 1878), and by Thomas Dwight (*Ibid.*, Jan. 1879, p. 202), go to show the fact

that asymmetry occurs at least frequently enough to render accurate measurements for the determination of shortening after injuries an impossibility.

Mr. Vernon's article on commencing cataract is timely and worthy of perusal, especially by general medical practitioners for whom it seems to have been written, because of the many cases of chronic glaucoma which are mistaken for incipient cataract. Would that every student sent from the medical schools of Great Britain and America knew this one fact in ophthalmology, that neuralgic pain and impairment of vision, associated with increased hardness of the globe, mean total blindness, and that iridectomy is the only hope for the patient. Thanks are due to Mr. Vernon for laying the subject before the students of St. Bartholomew's, in a paper free from those technicalities understood by but few.

While discussing this subject we shall notice the paper on *Wounds of the Ciliary Region, and their Treatment with Eserine*, by Mr. W. BRUCE CLARKE. He gives tabular statements of the cases treated before and since the employment of eserine, with apparently better results in the latter class of cases; but the small number of patients treated is not sufficient to prove the point. Moreover, sulphate of eserine (derived from Calabar bean) has been introduced so recently for the purpose of diminishing intra-ocular tension, and preventing prolapse of the iris through wounds of the eyeball, that we must wait for further experiments before accepting the results as proved.

Mr. Willett discusses the treatment of angular disease of the spine by Sayre's plaster of Paris jacket, and desires to express unhesitatingly the satisfaction he has experienced in its use. There is appended a table of 60 cases so treated during the first nine months of 1878; these are all instances of dorsal or lumbar caries, for he prefers to treat caries of the cervical vertebræ otherwise than by suspension, and the fitting on of a jury mast. An important observation is that there is a liability to syncope, and even occasionally to vomiting, during the suspension. He states that one in every four adults faints during the application of the plaster jacket, and that this occurs especially in women. In a short article following the one now under discussion, he records *A Case of Fatal Vomiting following the Application of Sayre's Plaster of Paris Jacket for Kyphosis*. Nausea occurred during suspension, and constant vomiting began some time after the patient left the hospital. The plaster bandage was removed, but the patient died in a few days. The autopsy revealed simple but great dilatation of the stomach, which was unsuspected. Mr. Willett is experimenting with the plaster jacket applied while the patient is suspended in the horizontal position with the face downwards. There has been in these cases no syncope or vomiting. In a few instances, where the patients were attacked by bronchitis while wearing the jacket, it became necessary to remove the dressing because of the urgent dyspnœa. The length of the time required for cure he is inclined to believe is rather longer than four to six months, as given by Sayre. He has moreover been unable to find, by taking the outline of the spinous processes before treatment and when cure has been affected, that there has been any straightening of the vertebral column. In the majority of cases a perceptible increase in the curvature has been apparent.

A rare and interesting case of *Multiple Sarcomata* is reported by Mr. HOLDEN, who merely gives the history and post-mortem record.

Antiseptic Surgery receives the praises of Mr. THOMAS SMITH, who relates his experience with the method of Lister during three years of hospital practice.

From Mr. MARSH we have a paper on *Manipulation in Surgical Treatment*, which, with the exception of some cases, tells but little that is not to be found in Wharton Hood's book "On Bonesetting," which should be read, by the way, by every surgeon.

The article on *Compression versus Inflammation*, by Mr. KEETLEY, gives some good points in the use of this means of combating the inflammatory process.

In the appendix an analysis of the *use of anæsthetics* in the hospital is given, which states that during 1877 chloroform was administered 699 times, ether alone 23 times, ether preceded by nitrous oxide 1123 times, and nitrous oxide and bichloride of methylene in a few instances. This is of importance, as showing how the safer anæsthetic, ether, is gaining the ascendency over treacherous chloroform even among English surgeons.

As the result of the examination of this volume representing the daily work of one of London's oldest hospitals, the reader will notice a characteristic which all such works are apt to have in common, namely, a considerable amount of padding. A few papers stand out prominently, showing the result of accurate scientific study, while others are interposed, apparently, for the purpose of covering so many pages, and of giving the volume the requisite bulk.   J. B. R.

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ART. XXI.—*Diphtheria: its Nature and Treatment, Varieties and Local Expressions.* By MORELL MACKENZIE, M.D. Lond., Senior Physician to the Hospital for Diseases of the Throat and Chest: Consulting physician to the Northeastern Hospital for Children ; and Lecturer on Diseases of the Throat at the London Medical College. 12mo. pp. 104. Philadelphia : Lindsay & Blakiston, 1879.

THIS little work exhibits the accuracy, care, fulness of research, and facility of condensation which have been displayed by its author in his previous essays on throat diseases. Its contents are divided into eleven chapters, entitled, successively, definition and history, etiology, symptoms, paralyses, diagnosis, pathology, prognosis, treatment, laryngo-tracheal diphtheria, nasal diphtheria, and secondary diphtheria, preceded by a brief preface, and followed by a full index.

The development of opinion concerning diphtheria during a period of nearly twenty years since any English work upon the subject has appeared, led the author to believe that a short sketch, from one who has had considerable opportunities of studying it, would be of interest and use to the profession. Allusion is made in the preface to diphtheria as the cause of the deaths of George Washington and the Empress Josephine ; but these deaths have been generally attributed to œdema of the larynx in acute laryngitis.

The definition of diphtheria, consuming nearly twenty-one lines, is in reality, rather a concise summary of the general character, manifestations, symptoms, and progress of the disease. Its language, in the outset, indicates the author's disbelief in the spontaneous origin of diphtheria ; for, instead of describing the disease as sometimes occurring *sporadically*, he introduces a new epithet, *solitarily*, to which attention is directed in a foot-note, and further on, in the chapter on etiology, the opinion is expressed that " those cases which appear to originate *de novo* probably always arise from the virus, often long dormant and forgotten, of previous cases." The argument for this opinion is discussed at full length, drawn from the researches of Simon and other writers on sanitary topics in this connection, as well as from individual observations, including those of the author, who mentions that in one instance he has known the poison to remain dormant for three years, and then again to become active.

In discussing the history of diphtheria, the evidence of researches is carried farther back than in any previous history that we can recall. Its probable recogni-

tion is traced to the Sanskrit *System of Medicine*, by D'hanvantare, "at a time nearly coeval with that of Pythagoras," and to the epidemic Askara of the Talmud, as well as to other authorities more familiar to the medical antiquarian. A very full and succinct historical record follows for eight pages, with numerous references; a little mine of bibliographic metal for future explorers. The observations of our own Bard (unwittingly accredited to Philadelphia instead of New York, being quoted from Trans. American Philosophical Society, Philadelphia, 1789, and not from his Researches, etc., on Sore Throat, N. Y. 1771) receive due acknowledgment for their accuracy.

With regard to the nature of diphtheria, the judicious statement is made that observations are not sufficiently conclusive to warrant a conclusion as to the essence of the disease; and it is intimated that the "germ theory" explains all the phenomena of the specific fevers. The remarks on climatic and atmospheric conditions favourable to the contagion, its mode of diffusion, and the like, hardly call for special comment other than that they faithfully represent the most approved current professional opinions, save, perhaps, that one attack probably affords a very slight protection against recurrence.

In describing symptoms, the disease is classified into several constitutional forms: (1) *typical*, (2) *mild or catarrhal*, (3) *inflammatory*, (4) *malignant*, (5) *gangrenous*, and (6) *chronic*. This nicety, growing out of a commendable love for method, seems somewhat in excess of what is required, inasmuch as differences of degree, dependent on a variety of causes, many of which are by no means constitutional, present us at times with groups of symptoms which cannot be referred to typical or other special varieties, but partake of several of the subdivisions. Indeed, too, our author states that the student must not expect to find the first three forms always clearly defined; on the contrary, they are apt to run into one another, or their special features may be more or less combined. Typical cases of disease, when not immediate clinical transcriptions in the strictest sense of the term, as rarely happens, are often ideal impressions of a series of cases from which a certain sequence of phenomena is deduced, without being susceptible of precise verification at the bedside. A typical case of diphtheria as described by the reviewer, for instance, would include the symptoms relegated to the inflammatory form of the disease in the work under discussion; those due to active hyperæmia, acute pharyngitis, tumefaction of the tonsils, enlargement and hyperæsthesia of the glands at the angle of the jaw, and so on.

Taking together the groups of symptoms in the first three divisions, we find no reference to the condition of the respiration, the nocturnal wakefulness and restlessness, and the cerebral manifestations in young and feeble children. The rapid rise in temperature and pulse-rate is duly noted, and it might be inferred, from want of direct allusion, either that there was no increase in the rate of respiration, or that it retained its normal proportionate relation to the pulse-rate as in febrile disorders generally; while it is a common point of comment that typical diphtheria is characterized by acceleration of the heart-beats without proportionate increase of the respiratory acts. The objective symptoms are unusually well described. Gangrenous diphtheria is said to be rare in Great Britain, except as a secondary phenomenon following scarlet fever, and appears to be more uniformly fatal than in the United States.

Chronic diphtheria, of which but little is known in this country, is described by a brief record of a number of examples, eleven of which came under the author's care in 1863-4, all walking cases and not much debilitated. There was laryngeal deposit in three of them; constant albuminuria in two, and intermittent albuminuria in two; the longest duration having been three months, the shortest seven weeks, and the average nine weeks. Mechanical removal of the

false membrane was in all the cases followed by bleeding, and quick reproduction of the deposit. Among cases quoted from other observers, two are mentioned from the Parisian Hôpital Sainte-Eugénie, in which false membranes were expelled for eight and ten weeks, respectively, after the performance of tracheotomy for laryngeal diphtheria.

In discussing the paralytic sequelæ of diphtheria, it is stated that in rare cases paralysis of the larynx may occur without implication of other structures, and that this paralysis may involve the whole muscular apparatus of the larynx, or may be limited to single muscles; the adductors (which close the glottis) generally suffering in instances of the latter sort, and often as to one cord only. Two cases of permanent paralysis of the recurrent nerve, following diphtheria, have come under the author's notice. The entire chapter on paralyses is one of the most valuable in the book.

The differential diagnosis of diphtheria from simple sore throat, scarlet fever, confluent herpes of the throat, acute tonsillitis, and acute laryngitis, is fairly discussed; but an opinion that herpes has no tendency to spread beyond the seat of its first efflorescence appears to the writer far too absolutely expressed.

Twelve pages are devoted to the chapter on pathology. No special significance is attributed to the parasitic phenomena of the deposit, and this is in accord with the opinion of our most reliable pathologists. In seven cases examined by the author for epiphytes he discovered the fungus in five, "in every case, however, in the superficial layer of the lymph." It is unnecessary to follow the author further in this interesting chapter, which, like all the others, gives due credit wherever it belongs; but we may record his conclusions, which are that the *primary septicæmia* is due to the specific poison, while absorption from the decomposing lymph is no doubt a cause of *secondary infection;* and that the local symptoms (the false membrane with its parasitic growth) must be regarded as the first evidence of constitutional poisoning, in fact as the first of the secondary phenomena.

In regard to prognosis, the special symptoms of grave import are stated to be high temperature, extreme prostration, hemorrhages, or urgent vomiting at the commencement of the attack, indicative of extensive general infection; and, other things being equal, the prognosis is serious in proportion to the thickness and extent of the exudation; while prostration and a tendency to syncope are alarming signs at any period of the attack. The presence of albumen is not considered a symptom of much importance. Dr. Wade, however, to whose recognition of this symptom the profession is chiefly indebted for a knowledge of its significance, considered impairment of the renal function always of grave augury; and it is generally regarded as an unfavourable indication, fatal results being apprehended whenever albumen is very abundant.

Sixteen pages are devoted to the important subject of treatment. Supporting treatment is advised, with free ventilation, and warm and moist air, and a bedroom temperature of from 60° to 65°—some degrees lower, therefore, than is usually recommended in the United States. Especial attention is directed to the importance of "feeding during the night when the vital power is usually at its lowest ebb"—a point well taken. The use of alcohol is recommended, not invariably, it is true, but at times, "with a boldness rarely needed in other forms of disease," a sentiment with which many of our most competent practitioners are in full accord. The first intimation of failure of the heart is designated as the signal for the unsparing use of that drug; and attention is directed to the importance, at the same time, of keeping the patient with his head low, and interdicting any movement whatever. The value of the various remedies in most commendation is briefly and fairly discussed, preference being given to iron as undoubt-

edly the most useful recuperative agent.   Thirty minims of the tincture of the perchloride of iron, every two or three hours, are recommended for an adult, and proportionate doses for children, combined with glycerine, and diluted with water.   The occurrence of headache, with high temperature, vomiting, and symptoms of septic poisoning, are regarded as indications for quinia in full doses, not to be persisted in, however, if benefit fails to result in thirty-six or, at the most, forty-eight hours.   It is the belief of the writer that too much is often expected from quinia in diphtheria, and that its continuance, when not positively beneficial, induces unfavourable perturbation of the nervous system.   As to mercury, it is stated that its general influence rather promotes the spread of the exudation than checks it.   The author has found distinct benefit from using the *perles* of copaiba in catarrhal cases, but does not state that he administers the drug in the large doses employed by Trideau and others.   Chlorate of potassium, so much employed in the United States, is mentioned among general antiseptics as having the general weight of evidence very much in its favour ; ten to twenty grains being indicated as the dose, repeated every two or three hours.   Sulphocarbolates have proved of service in the author's hands in the *secondary* poisoning of diphtheria, but have appeared to him quite useless in the *primary* septicæmia.   Salicylic acid is mentioned as having been of apparent advantage, one to two teaspoonsful of a solution, as follows, being recommended every three hours : ℞. Acid. salicylic. ʒiss ; Spt. rect. ʒijss ; Aquæ destill. ad ʒiv ; M.   Ft. liquor. Senega, carbonate of ammonium, and the balsams are mentioned as useful expectorants.

With regard to local treatment it is remarked that " the profession has given up the use of caustics altogether, being convinced that they rather aggravate than check the local process."   The author now seldom uses a local astringent except iron, which acts topically, also, when employed as a constitutional remedy.

Of all local solvents, lactic acid is considered the most reliable.   The author generally applies it freely with a brush, or by means of a piece of lint attached to a wooden rod ; and he has never met the inconvenient results from its use described by Küchenmeister—ulceration of the mucous membrane of the lips and mouth.   Lime-water is said to be useful when the false membrane is not very thick.   The use of the fumes from lime in process of slaking, the very valuable suggestion of Dr. Geiger, of Dayton, Ohio, so much practised in the United States, is not mentioned.

Passing much interesting matter on the local use of antiseptics, with which the readers of the Journal must be familiar, attention may be directed to a new method of local treatment, apparently original with the author.   This consists in the application of certain *varnishes*, which, by exclusion of air from the false membrane, appear to exert antiseptic influences.   The author has tried gum benzoin, gum tolu, mastich, and resin, which may be dissolved in rectified spirit or in ether, or in a mixture of the tincture of the gum or resin with ether.   Preference is expressed for the ethereal solution (1 in 5), and for tolu as the pleasantest to the patient, and the most lasting as a varnish, so that it has to be least frequently applied.   Before making these applications, it is directed that the surface of the false membrane should be dried with blotting-paper.

The use of pellets of ice in the mouth, and the application around the neck of bags or bladders of ice is recommended as especially indicated for relief in the first stage of the disease, particularly when there is much inflammatory tumefaction.   As is well known, some pathologists believe that ice retards excessive cell-growth.

Heat is regarded as a useful agent when the false membranes have attained any

considerable degree of thickness, both in the form of hot fomentation externally, and in the form of steam inhalations.

Dr. Prosser James, of London, is credited with having first suggested steam as a remedy in diphtheria, but he is antedated by Wanner (*Du Croup et de son traitement par la vapeur d'eau*, Paris, 1834). As is well known, steam inhalations have recently been strongly advocated by Oertel, of Munich, to precipitate a suppurative process beneath the false membrane and thus detach it; and in this view he has the support of our author. It is not unlikely, however, that, when employed sufficiently early, these inhalations keep the exuded or cast-off matters diffluent, and thus more easily detached by expectoration; and if administered in the fumes of slaking lime there is an additional advantage in the simultaneous penetration of some of the innumerable particles of suspended lime beneath the edges of the false membrane at many points, prying it up mechanically, as it were, and thus providing inlets for access of the steam which effects the detachment subsequently. There is no doubt as to the benefits to be obtained from steam, whether alone or mingled with lime, as an agent in detaching the membranous products, especially when occluding the air-passage.

Chapter IX. is entitled "Laryngo-tracheal Diphtheria, formerly called Croup." Here we see that our author, with the majority of his professional colleagues, believes in the identity of croup and diphtheria. The usual arguments for this opinion are presented. The fact that the general symptoms in croup are less severe than when the membrane is thrown out on an extensive portion of the pharynx is explained on the theory that the septic symptoms are in part secondary to the local processes. "For whilst the lymphatics of the mucous membrane of the soft palate, of the tonsils, and of the back of the pharynx have very free communication with the numerous glands below the angle of the jaw, the absorbent vessels of the mucous membrane of the larynx and trachea are conveyed only to the solitary gland just below the greater horn of the hyoid bone, and the small gland at the side of the trachea." This application of the important anatomical fact demonstrated by Luschka, and duly accredited to him here, is novel to the writer; and certainly seems to show that "there is much less liability to general infection when the local process has seized only on the" larynx and trachea. Still, however, there are many observers who claim to make clinical distinctions between croup and diphtheria, as demonstrated at the bedside. One is the retention of the normal relation of the respiration to the pulse in the febrile condition, alluded to, in an earlier portion of this article, as not being maintained in typical cases of diphtheria; others are that the pulse is often strong and hard, the heart not depressed; that albumen is rarely in the urine; that croup is not followed by paralysis, and some further points of minor consideration. Our author disposes of two of the most important in the group by stating that albuminuria is often present in croup, and that paralysis is occasionally met with in cases that survive. Amid all these doubts and uncertainties who shall decide? When partisans of both views attend undoubted cases of inferred croup together, and report on them alike—then, and not until then, can this question be determined. The subjective and objective symptoms, laryngoscopy included, are well presented, and the points of differentiation from catarrhal laryngitis and laryngismus indicated. The dyspnœa is referred to the inflammatory tumefaction and plastic exudation, which give rise to spasm of the adductors. Paralysis of the abductors is denied; yet we have the authority of Niemeyer and others that they have observed it in the laryngoscopic image. In reference to treatment, it is to be noted that direct mechanical attempts at removing loose membrane from the larynx are advised, the appliance used by the author being a

laryngeal-brush of squirrel-tail, the hairs of which cover the sides of the brush, and present upward.

In discussing tracheotomy, the performance of which is justly considered an important duty in certain cases, attention is properly directed to the extreme importance of withdrawing any loose false membrane immediately after the operation, and to the necessity for careful supervision of the after-treatment.

The short chapter on Nasal Diphtheria does not call for comment. A few pages on Secondary Diphtheria close this interesting volume. The diseases in which the manifestation occurs, as abridged from a table by Sanné, are measles, scarlatina, whooping-cough, typhoid fever, smallpox, nettle-rash, bronchitis, pneumonia, pleurisy, tuberculosis, and various cachexiæ (scrofula, chronic diarrhœa, etc.). The treatment, local and general, must be the same as in the primary disease.

The increasing importance of diphtheria in a clinical and sanitary point of view, is such that every valuable contribution from a reliable source merits full consideration; and as the little volume of Dr. Mackenzie is both valuable and well-fathered, it has not been deemed improper to devote considerable space to an exposition of the character of its contents. It is hoped that the summary given will induce all our interested readers to find a place for it in their working libraries.   J. S. C.

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Art. XXII.—*Recent Works on Medical Diagnosis.*

1. *Clinical Diagnosis; a Handbook for Students and Practitioners of Medicine.* Edited by James Finlayson, M.D., Physician and Lecturer on Clinical Medicine in the Glasgow Western Infirmary, etc. With 85 illustrations. 12mo. pp. 546. Philadelphia: Henry C. Lea, 1878.

2. *Differential Diagnosis; a Manual of the Comparative Semeiology of the more Important Diseases.* By Dr. F. de Haviland Hall, M.D., Assistant Physician to the Westminster Hospital, London. American edition, with extensive additions. 8vo. pp. 205. Philadelphia: D. G. Brinton, 1879.

3. *A Manual of Physical Diagnosis.* By Francis Delafield, M.D., and Charles E. Stillman, M.D. Quarto, pp. 30. New York: William Wood & Co., 1878.

To most of our readers it will probably seem trite to say that there can be no correct therapeutics in the absence of diagnosis, and that consequently the latter is one of the most important branches of the medical art; but it would appear that all do not hold this opinion, since we recently heard the contrary of this proposition gravely maintained. That it may sometimes be necessary to treat symptoms before an accurate diagnosis can be made, all will admit; but it will scarcely be contended that this is desirable, or that it is often necessary. For ourselves, we hold that it is more important to teach students how to recognize the different forms of disease than how to treat them, having witnessed, in the course of a score of years of practice, some decided changes in the management of disease. The art of diagnosis, on the other hand, while it has improved, has undergone no fundamental change during this time; and while our methods of examination have increased immensely in the last fifty years, it is questionable whether we do not sometimes lose by neglecting those upon which our predecessors were accustomed to rely. These few remarks seem to be called for by the almost simultaneous appearance of three books on diagnosis—a sufficient proof of the

high estimation in which it is held by the profession generally. Without further prelude we shall proceed to notice the books separately.

1. Dr. Finlayson has been aided in the preparation of his Handbook by several collaborators. Thus Prof. Gairdner contributes an excellent chapter on the Physiognomy of Disease ; Prof. Stephenson one on Disorders of the Female Organs ; Dr. Robertson one on Insanity ; and Dr. Gemmell chapters on the Sphygmograph, and on the Physical Examination of the Chest and Abdomen. Dr. Joseph Coats, too, in addition to furnishing some Notes on the Method of Performing Post-mortem Examinations, is the author of the article on the Examination of the Fauces, Larynx, and Nares. A book coming from such hands is not likely to be even an indifferent one ; and such is not the case.

In expressing an opinion of the book as a whole, we should say that it is more likely to be useful in fitting the student or young physician to undertake the examination of a patient, than as a book of reference when he finds himself confronted with a difficult case. Thus in no part of it are the leading features of two or more diseases, having points of resemblance, brought into marked contrast with one another, or placed side by side in tabular form for the convenience of study, as in one of the other books whose title heads this notice. The student will find, on the other hand, the methods of examining the various organs of the body very carefully explained, so that he will know before he comes to his patient what symptoms he is to expect, by which, as the author expresses it, " the case is thus put in a fair way for a diagnosis, when this becomes possible."

The book, as a general rule, is very fairly representative of existing knowledge. In the article on nervous disease there are, however, one or two deficiencies. Thus the author seems to make no distinction between the shaking palsy of the aged and multilocular sclerosis, for an accurate description of which we are indebted to Charcot. If there is any allusion to sclerosis of the lateral columns it must be a very brief one, for it has escaped our notice.

2. A year or two ago, Dr. De Haviland Hall wrote a book entitled *Synopsis of the Diseases of the Larynx, Lungs, and Heart*, which we have no doubt, judging from the reputation of its author—for we have had no opportunity of examining it—was an excellent one. This book the American editor has added to, so as to make it include, he says, all the more frequent and more important diseases. In doing this it became necessary to change its title, but Dr. Hall's name alone appears upon its cover and title-page, so that he must stand sponsor not only for much that he never wrote, but possibly for something that he may not wholly approve of ; which, as there is nothing to indicate the new matter, is a liberty which we regret Dr. Hall is without the power to resent. All the more frequent and important diseases are, however, not included in the book ; thus there is no allusion made to such diseases as erysipelas and chorea, which certainly occur often enough in every one's practice, and none to Graves's disease, which is an interesting affection, if somewhat rarer than the other two.

Much may be said in commendation of the book. Its plan is excellent; the diagnostic points of diseases bearing the greatest resemblance to one another being arranged in tables placed side by side, in order that the student may compare them readily. In the main the plan is well carried out, but distributed throughout the book are passages which seem to show that the editor, whoever he may be, has derived the greater part of his information from books rather than from bedside observation. In some places, indeed, contradictory statements are made in the tables—a mistake which would hardly have been made by any one engaged in clinical teaching. For instance, on page 28 we are told that the eruption of

rötheln—which, by the way, is not an English word—" fades in about four days *without desquamation*," while two pages further on desquamation is said to take place in "minute particles of cuticle like scales of fine bran." The truth in the matter is, according to Thomas, the author of the article on Rubeola, in Ziemssen's *Cyclopœdia*, as follows : There is no desquamation in pure cases of the disease. It does occur, however, when, in addition to the characteristic eruption, there is also one of miliary vesicles. Again, on page 123, we find the editor quoting approvingly a passage from a paper by Dr. A. L. Loomis, in which that gentleman says that catarrhal phthisis, which, we presume, will generally be admitted to be the more frequent form of the disease, is always to be suspected if the illness has begun with the ordinary symptoms of a cold ; and, on the following page, giving as the diagnostic points of the period of invasion of the same form, " precursory catarrh, sometimes pneumonia, croup, measles, or other inflammatory disease ; cough deepens, proceeding from the trachea to the alveoli and bronchioles, indicated by dark-yellow streaks in the sputum." These are certainly statements which are hardly compatible with those he makes on pages 128 and 129 when speaking of the general clinical symptoms of phthisis, that the cough is at first dry, and that it commences gradually, without marked disturbance or coryza.

A few typographical errors have here and there escaped the notice of the editor, but the appearance of the book is otherwise very creditable to the publisher.

3. Dr. Delafield has, we think, erred in issuing his *Manual of Physical Diagnosis* in quarto form. The circumstance that it is interleaved, in order that it may be used as a note-book as well as a guide, will scarcely counterbalance the disadvantage of its size to the student, who is expected to carry it with him in his visits to the hospital, or to the physician who needs its aid in his daily practice. Certainly, "those who have to teach the art of physical diagnosis," for whose use, the author tells us in his preface, it is intended, as well as that of the student of medicine, would prefer—if, indeed, there be any teachers who require its help in the preparation of their lectures—Dr. Flint's Compendium of Percussion and of Auscultation, which can conveniently be hid away in the waistcoat pocket. The book, however, despite its cumbrous size, is an excellent one of its class, the physical signs of the diseases of the chest and abdomen being given as fully as is compatible with its plan. The author attaches, very properly, much importance to the pitch of a sound as an indication of disease ; in this, as our readers are aware, following the elder Flint. He applies the term sonorous and sibilant breathing to the sounds which are usually known as sonorous and sibilant râles— a deviation from custom for which it seems to us there is no good reason.

Appended to the volume are drawings, very skilfully executed by Dr. Charles E. Stillman, representing, by means of superimposed plates, the position of the different thoracic and abdominal viscera.   **J. H. H.**

ART. XXIII.—*Les Tumeurs Adénoïdes du Pharynx Nasal; leur Influence sur l'Audition, la Respiration, et la Phonation; leur Traitement.* Par le Dr. B. LŒWENBERG. 8vo. pp. 74. Paris : V. Adrien Delahaye et Cie., 1879.

THE scope of this admirable work is fully indicated in its title-page. History, Anatomy, Etiology, and Symptomatology occupy the first thirty-four pages,

over fifteen pages being devoted to a most graphic description of symptoms. The latter are, a suppression of the nasal respiration, and its consequences; the altered physiognomy; the ill effects on the pharynx and nasal passages, and the diminished sense of smell. Other evil consequences of a cessation of nasal respiration, and the substitution of breathing through the mouth, are the comparative impurity of air respired through the mouth, stunted growth of the body, snoring, arrested development of the chest, and nasal enunciation, all of which are seen chiefly in children of the lymphatic diathesis, as they are most likely to be affected with these growths in the naso-pharynx.

In adults the ability to sing may be lost, and various reflex diseases in the larynx, dependent upon altered innervation in the muscles, may arise from the pharyngeal affection.

These tumours have a very bad effect on the middle ear. As a consequence of their presence in the pharynx, and the obstruction they exert on the mouth of the Eustachian tube, as well as the irritation they keep up in the pharynx, there may arise two forms of inflammation in the ear, viz., catarrhal inflammation, and the suppurative form with perforation of the drum-head. Before any cure of the aural disease can be effected, the adenoid tumours must be removed or destroyed.

Dr. Löwenberg states that very often the results produced by these tumours in the pharynx are ascribed to enlarged tonsils. The two conditions may exist together, but removal of the tonsils will not relieve the symptoms. Hence the utter failure of this operation to cure deafness. The rhinoscope and the digital examination of the pharynx are indispensable in establishing the diagnosis. The latter method is to be carried out most easily by asking the patient to breathe through his nose, and to throw out his thorax, while the head is thrown back as far as possible. The index finger used in this examination should be oiled, or made bland in some equally good way, before introducing it, and the finger-nail should be pared close. When these growths are in the naso-pharynx, the finger thus used will be found tinged with blood on withdrawal, which is due to the extreme vascularity of these growths. In some cases the pharynx and mouth of the Eustachian tube may be examined by means of long specula (Zaufal's) introduced through the nose.

It will be necessary to make a differential diagnosis between these adenoid tumours of the nasal pharynx and simple chronic coryza, hypertrophy of the tonsils, nasal polypi, and naso-pharyngeal polypi.

The prognosis is always favourable. When alluding to the etiology of these growths the author states that heredity has much to do in their production, and he gives an account of a family in which the mother, thirty-five years old, and four children from six years of age to eight months, were simultaneously afflicted.

The treatment of this adenoid affection of the pharynx is divided into three parts: 1. Care of the general health. 2. Surgical treatment of the tumours. 3. The institution of measures against concomitant or consecutive affections. The first is to be accomplished by hygiene, abundance of exercise in the open air, and gymnastics calculated to stimulate properly the respiration and circulation, as well as the general nutrition. Cold baths, sponging, cod-liver oil, bitter tonics, preparations of iodine, iron, sea-bathing, and saline and sulphurous mineral waters, are also advised. Irritation of the pharynx is to be carefully avoided; consequently all stimulating and hot food or drinks must be prohibited, and alcohol and tobacco avoided. Excessive use of the voice and the respiration of unwholesome air must also be guarded against.

Local treatment is divided into *cauterization* and *ablation*.

Cauterization, repeated often, will usually be sufficient, especially when the

tumours or vegetations are flat or sessile, and hence offer no good purchase for a cutting or constricting instrument. This method is also of great service in children whose parents are unwilling to permit any more severe operation. Of course, the greatest care is necessary in applying any form of cautery to the naso-pharynx. Nitrate of silver, fused on a probe, is preferred by our author. The naso-pharyngeal douche with salt water should always be employed after the use of nitrate of silver in this strong form, and it is also recommended to use a gargle of salt and water. In employing the latter it is suggested by Dr. Löwenberg that the patient throw his head as far back as possible, letting the gargle go down as far as he can without swallowing, and then throw it as high as possible behind the velum. The ablation of adenoid tumours in the naso-pharynx can be accomplished by using a curette with cutting edges, by crushing and constriction, by an annular knife (of Meyer, of Copenhagen), by the instrument of the author, and by means of the galvano-caustic.

The author has employed chiefly the first method and his own. The annular knife of Meyer, which is to be introduced through the nostril, he entirely rejects; very wisely, in our opinion. His own method consists in the removal of these growths by means of a curved forceps with cutting ends. The width of the cutting edge at the end of the forceps is 7 mm. These edges are against each other when the instrument is closed. Its entire length is about 24 c.m., or 9½ inches. It is slightly S-shaped, and the joint is very near the cutting end. This is introduced into the naso-pharynx through the mouth, and is to be kept under the guidance of the eye, aided by the rhinoscopic mirror, when possible; but if this is not possible, the instrument must be guided by the index finger, to the morbid growth. The blades are then to be separated, and one closure of the cutting edges over the tumour will sever it from its attachment, and the growth is generally brought away with the instrument. The hemorrhage is usually copious, but is to be controlled by ordinary means. The galvano-caustic Dr. Löwenberg has never employed.

The treatment of concomitant and consecutive affections consists in the measures taken to correct respiration through the mouth, and its bad results, and the therapeutics of diseases of the ear, which constantly arise in consequence of the adenoid growths in the naso-pharynx. The latter diseases cannot be cured until the morbid growths are removed. For the aural discharge in these cases absolute alcohol has been found of greatest value. This has been used entirely undiluted in some cases, and in others diluted with water in varying proportions. In some cases tannin has been added to it, with apparent advantage. Insufflations of powdered alum have also been used with great benefit in discharges from the ear, constantly met in connection with morbid vegetations.

This brochure is to be considered a very valuable addition to the literature of naso-pharyngeal diseases and their effects, and will amply repay a perusal.

C. H. B.

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Art XXIV.—*Transactions of the American Ophthalmological Society.*
Fourteenth Annual Meeting.   8vo. pp. 140.   New York, 1878.

OUR last notice closed with the statement that the next number of the *Transactions* would contain a paper on the spontaneous cure of separation of the retina, by Dr. Herman Althof, of New York, but we are compelled to commence this one with the sad announcement of his premature death. Dr. Althof was one of the founders of the society, and was twice its president, and his high intelligence,

vigorous manhood, and most genial manners made him a general favourite with its members.

Dr. Arthur Mathewson, of Brooklyn, strongly urges *the use of nitrous oxide as an anæsthetic in strabismus operations*, and reports five cases in illustration. The use of the gas in these cases was suggested by the fact that Drs. Giberson and Rushman, of Brooklyn, had used it in cases of amputation, and found that their patients could be kept under its influence for half an hour without unpleasant consequences. A strabismus operation requires but a few minutes for its performance, and the prompt recovery of the patient from anæsthesia gives the operator the much desired opportunity to test almost immediately the effect produced, and to decide if it is necessary to increase or diminish the effect of the dissection, or to operate on the other eye. The impossibility of doing this is a serious objection to the use of ether or chloroform.

Dr. Geo. Strawbridge, of Philadelphia, reports I. *Tumour of the Optic Nerve—its removal without enucleation of the eyeball.* Four muscles and considerable conjunctival and surrounding tissue were left intact, and an effort was made to preserve the eyeball. The cornea sloughed, and the lens and vitreous escaped, and the final result was an atrophied eyeball. Microscopical examination showed the tumour to be a glioma. II. *Cyst of the Iris.* The cyst occupied the nasal half of the iris, extending far over into the pupil, and was of one year's growth. The cyst was removed by a free iridectomy ; the wound healed rapidly, and the patient had $V=\frac{20}{70}$. Microscopic examination showed that "the outer wall consists of the stroma and muscular coats of the iris, the uvea being absent. This was lined with a layer of squamous epithelial cells, swollen and in an advanced stage of fatty degeneration. These cells are free from each other, and are surrounded by granular matter, fat, and cholesterine crystals. It might therefore be classed with certain sebaceous tumours, so called, in which the common cystoid cell is wanting, and one that might be cited in proof of Paget's theory that they are sometimes a new formation." III. *Congenital Malformation of Conjunctiva resembling Pterygium Externum.* "The patient was an infant six weeks old. The corneæ were covered to fully one-half their surface with a growth of conjunctiva extending from the outer lid commissure."

Dr. D. B. St. John Roosa, of New York, contributes a paper on *The Relations of Blepharitis Ciliaris to Ametropia.* This article is an appendix to one with the same title which appeared in the *Transactions of the Fifth International Ophthalmological Congress*, and which has already been noticed in this Journal. Dr. R. adds the results of examination of forty-eight cases from the Manhattan Eye and Ear Hospital, and of forty cases from private practice, in nearly all of which there was a low degree of refractive defect. The same author has also given the results of "an examination, under atropia, of the refractive state of eyes with normal vision and which had never been affected with asthenopia or inflammation." The number of persons examined was fourteen, and correct refraction was found in only three ; in the others there was hypermetropia of an average degree not very different from that found in the asthenopic cases. The difficulties in the way of making examinations of this kind are obvious, and these statistics perhaps hardly include a sufficient number to justify a very positive conclusion, but so far as they go they are very valuable, and it is to be hoped that they may induce other observers, who have the opportunity, to add to them. Dr. Roosa "still believes that there is much more than a mere coincidence in the frequent occurrence of blepharitis in connection with strain on the accommodation from refractive defects," but thinks there is a tendency to overrate the curative power of glasses. We believe that this is about the correct statement of the case, and, at the risk of being considered regressive, would unite with the author in

calling attention to the danger of adding optical therapeutics to the long list of valuable remedies that have been brought into unmerited discredit by demanding too much for them. The most enthusiastic specialist will find it to his advantage to bear in mind that there may be other causes than refractive defects for headaches, hysteria, chorea, and lachrymal obstruction.

Dr. J. S. PROUT, of Brooklyn, in a paper on *Lachrymal Conjunctivitis, and some of the other injurious effects of Retention of the Tears*, calls attention to the irritating effects of retained tears, the importance of which he thinks is not so generally recognized as it should be. He shows that diseases of the conjunctiva, cornea, and lids are often prolonged by the failure to recognize and treat a slight obstruction of the lachrymal passages.

Dr. HENRY W. WILLIAMS, of Boston, reports a case of *Extirpation of the Ossified Choroid without Enucleation of the Eyeball*. The anterior portion of the eye, including the ciliary region, was abscised, the osseous shell and the fluid vitreous were removed, and the edges of the sclerotic were brought together with sutures. Dr. W. thinks that this procedure affords ample security against the danger of sympathetic inflammation of the other eye, and that a better support for an artificial eye is obtained than after enucleation.

Under the head of *Cases illustrating two rare diseases of the Eyelids*, Dr. CHARLES S. BULL, of New York, reports a case of gummy infiltration of the tarsus, and one of amyloid infiltration of the lid and orbit. In the former case the patient recovered completely under treatment by mercury and potass. iod.

The subject of the amyloid affection, a child four and a half years of age, ultimately died with brain symptoms from extension of the disease from the orbit into the cranial cavity. The disease commenced with redness and swelling of the left upper lid near the orbital margin. The swelling increased and became tense and hard, and assumed the appearance of cellulitis. There was marked exophthalmus, and the cornea ulcerated and sloughed. A deep incision was made into the orbit but no pus was met with. The preauricular gland was indurated and swollen, and there was a discharge from the left ear. Enucleation of the contents of the orbit was advised but was declined by the patient's parents, and no postmortem examination was allowed. A small piece of tissue, removed from the orbit when the incision was made, was examined microscopically. There was "in some isolated spots a luxuriant granulative tissue. There were very few vessels, and in those which existed the walls were very much hypertrophied, mainly at the expense of the calibre of the vessels, which in some could scarcely be distinguished. There was very little trace of either connective or adipose tissue, but the main mass appeared to be a homogeneous, structureless infiltration."

Dr. BULL also reports a case of *Syphilitic Gummata of the Conjunctiva*, occurring in connection with gummata of the sclera.

A Case of Spontaneous Cure of Subretinal Effusion is reported by Dr. DAVID WEBSTER, of New York. It occurred in the practice of Dr. C. R. Agnew. The patient, a clerk, 47 years of age, highly myopic, had only sufficient vision to count figures at the distance of one foot. He was advised to try rest in the supine position, and lay on his back in a darkened room for twenty-three days. At the end of that time he had $V = \frac{10}{200}$, and no separation of the retina could be seen, though there were some floating bodies in the vitreous. Vision continued to improve, and in two years afterwards he had $V = \frac{20}{100}$, with $-\frac{1}{2\frac{1}{2}}$. The visual field was complete.

Dr. J. J. B. VERMYNE, of New Bedford, Mass., contributes the report of *A Case of Multiple Rupture of the Circulus Iridis Minor, without other Injury to the Eyeball*, and gives an account of the literature of the subject, from which it

appears that the accident is a rare one. The patient was struck violently across the nose and eyebrow by a piece of wood from a turning-lathe. There was a downward coloboma extending nearly to the attachment of the iris, and a little above it, on the nasal side, a small notch in the edge of the pupil.

A *Tumour of the Conjunctiva, Simulating Cyst*, is described by Dr. RICHARD DERBY, of New York. It was observed on the nasal side of the eye of a healthy child. The tumour was removed, and found to consist of connective tissue fibres and hypertrophied conjunctival tissue.

Dr. L. S. DIXON, of Worcester, Mass., reports *Cases of Sarcoma of Choroid, and Retinitis Albuminurica.* The first was that of a healthy man of 50 years, who had been suffering from severe pain in the left eye for two months. There was slight episcleral injection on the outer side of the cornea, and tenderness on pressure over that region, but vision remained normal. There was no increase of tension, and the ophthalmoscopic appearances were natural. Vision afterwards failed, from haziness of the vitreous, and was finally reduced to light perception, and the pain increased in intensity. Enucleation was performed with entire relief from pain. There was a tumour, or thickening, $\frac{1}{12}$ of an inch thick, occupying one-third of the circumference of the ciliary region on the outer side, and involving only the ciliary body and choroid. It proved to be a round-celled pigmented sarcoma. Six months afterwards a slight redness appeared in the ciliary region of the other eye to the nasal side of the cornea, with occasional twinges of pain. The pain became more constant and intense, and the history of the left eye repeated itself in the right. The patient died, apparently, from exhaustion, just a year after the enucleation of the eye first affected. There was no post-mortem.

In the case of albuminuric retinitis, the disease of the retina was fully developed in both eyes before there were any symptoms of the constitutional affection. There was but the faintest indication of albumen in the urine, and hyaline casts were found only after repeated and careful microscopical examinations.

The patient died with convulsions and hemorrhages about a year afterwards.

The next paper is on *Intraocular Circulation: Rhythmical Changes in the Venous Pulse of the Optic Disk*, by Drs. O. F. WADSWORTH and J. J. PUTNAM, of Boston. Changes in the pulsating portion of the larger branches of the vena centralis, were found to afford the most satisfactory indications of variation in the retinal circulation.

The following observations were made : I. *Compression of the Jugular Veins.* Its effect on the intraocular circulation was so slight as to be considered doubtful. II. *Pressure on the Carotid of the same side with the Eye examined* caused a cessation of all pulsation of the veins on the optic disk, and as soon as the pressure was relaxed the veins refilled, and the normal pulsation returned. This, the authors think, favours the theory of Donders, that the venous pulse on the disk is due to compression of the vein at its point of exit at the time of the arterial diastole, and a consequent backing up of blood. III. *Inhalation of Amyl Nitrite* caused a reduction in size of the vein at its pulsating point. The pulsation did not cease, but was very much diminished. IV. *Rhythmical Changes in the Venous Pulse.* "Besides pulsating in the usual manner, the vein, at the point alluded to, was seen to dilate and contract gradually, in periods corresponding to about five respirations. The vein thus seemed to be pulsating under the influence of two distinct systems of waves, one synchronous with the cardiac impulses, the other, the long waves, due perhaps to changes in arterial tension."

Dr. C. R. AGNEW, of New York, writes of *Cases of Ophthalmic Disease, in which enforced exposure to Light and Air was Salutary*, calling attention to the fact that injury is often done, when photophobia is the prominent symptom, by

yielding too much to the patient's desire to shield the eyes from light. In an obstinate case of keratitis, with intense photophobia, in a child six years of age, a cure was effected by frequent etherization (seven times in two weeks), and exposure of the cornea to light and air. Good results had also been obtained in older subjects, by forcible exposure without etherization.

The hygienic effect of light in the chamber occupied by a patient, is of great importance ; and Dr. Agnew thinks it is a question whether light should ever be excluded, and whether it is not better, when the eyes do need protection, to secure it by bandages, shades, or glasses.

Dr. VERMYNE, of New Bedford, Mass., reports a case of *Photopsy from an Injured Eye, persisting six months after Enucleation.*

Dr. WM. THOMSON describes *A Practical and Rapid Method, with an Instrument, for the Diagnosis of the Refraction.* It would be impossible to give a definite idea of this ingenious addition to our means of diagnosis, without the use of diagrams, and more space than is at our disposal. We must, therefore, refer those who are interested in the subject of refraction, to the paper itself. The test is based upon the measurement of the circles of diffusion upon the retina, which result from defects of refraction. If an eye is emmetropic, a point of light will form a sharp image upon the retina without circles of diffusion, and when two such points are approached towards each other, their images will not be fused until one light is actually in contact with or behind the other. If the eye is myopic or hypermetropic, each point of light will be represented on the retina by a circle of diffusion, and by measuring the distance between the lights when the margins of these circles come in contact, their diameter can be estimated and the degree of myopia or hypermetropia calculated.

Dr. JOHN GREEN, of St. Louis, suggests *some improvements in instruments and appliances for diagnosis.* The original edition of his well-known tests for astigmatism having been exhausted, some improvements and additions have been introduced, the most important of which is the construction of the diagrams on a larger scale. There are also some " stereoscopic diagrams for testing binocular vision," which it would be useless to describe without the cuts.

The next paper is on *The Etiology of Retinitis Pigmentosa, with cases,* by Dr. DAVID WEBSTER, of New York. He gives nineteen cases from the practice of Dr. C. R. Agnew, and three from his own. The points principally dwelt upon are consanguinity of parents, and heredity. Consanguinity was traceable in only three out of the twenty-two cases, or 13.6 per cent., which he thinks does not very much exceed the general percentage of intermarriage of blood relations in the United States. In addition to this consideration, in one of the three cases heredity undoubtedly existed, and in another it was probable ; so that his cases hardly tell in favour of consanguinity as an active cause. Heredity was known to exist in seven cases, and was suspected in several others. Three of the patients were members of the same family, and three others had brothers, sisters, or cousins with the same disease. There was suspicion of inherited syphilis in only one case.

Of nine cases reported in this Journal for 1873 (p. 415), but two were the only members of their family affected ; heredity could be traced in two, and consanguinity of parents in only one.

Dr. GEO. T. STEVENS, of Albany, reports the *Enucleation of an Eyeball, followed by immediate and marked reduction of the amount of urine passed, in a case of Diabetes Insipidus,* and thinks we have here " the phenomenon of an obstinate and dangerous disease of distant organs, having for its exciting cause an injury to the ciliary body, almost entirely relieved by the removal of the eye, but continued in a modified degree by a neuritis of some of the branches of the ophthalmic nerve acting as a secondary centre of irritation."   G. C. H.

Art. XXV.—*Transactions of State Medical Societies.*

1. We find in the *Missouri Transactions* an excellent essay by Dr. H. N. Spencer, in which he directs attention to the great importance of watchfulness over the ears, during the course of the exanthemata, in order to prevent, or treat during the curable periods, troubles which so rapidly tend to become incurable, and even dangerous to life.   The disposition of disease to spread from the throat through the Eustachian tube is too little remembered in practice.   When grave inflammation has been set up in the ear, he recommends prompt incision of the membrane of the tympanum, if other means do not speedily relieve.   Many cases of deafness after scarlatina could, he believes, be thus prevented.

In an article on simple conjunctivitis, Dr. Michel deprecates the use of astringents.   When acute, the disease is self-limited.   Constitutional treatment in some cases, rest, protection from irritation by light, heat or cold, or dust, seem to him the rational procedure.   Counter-irritation does no good.

Dr. Howlett reports a case of extra-uterine fœtation.   The child died in the eighth month, but was not removed till two years later.   The weight of the fœtus when taken away by abdominal incision was one and three-fourths pounds. Patient did not miss a meal nor suffer a pain after operation, and in four weeks was up and out of doors making calls.

An article by Dr. Moses on the Hystero-Neuroses, papers on local mineral springs, and several others, make this number quite a profitable one.   .

2. Two cases of hepatic abscess are reported in the *Minnesota Transactions.* In both there were few of the classic signs of abscess.   Both were treated by aspiration, with relief, and reasonably prompt recovery.   Among other cases, is a fatal one of purpura in an infant; and that of a little girl of thirty months, concerning whom the question is asked, "was she hysterical?" on account of a confirmed propensity to devour mud and plaster.

A correspondent of the Society, now resident on the Southern California coast, reports the remarkable ease and quickness with which wounds there heal.   He does not find speedy convalescence from acute disease; indeed, is inclined to think recovery rather less rapid than in Minnesota.

An interesting discussion is reported as to the influence upon the fœtus of opiates given to the mother.   Much difference of opinion was discovered.

The loveliness of jury-trial is here illustrated in the account of conviction, and victimization in $500 damages each, of an imprudent devotee of Venus and a physician, upon a monstrously improbable and unproved allegation of an abortion brought on without consent of the woman, and, *she says*, under chloroform forcibly administered, in a hotel-room at mid-day.   The woman was a prostitute, who had wound her toils around an unwary man, and thus sought to black-mail him.   How any decent twelve men could look a judge in the face while rendering such a verdict, we are unable to comprehend.

A queer case of hallucination, and insane impulse, is contributed by Dr. J. E. Bowers. A young woman, just developed from childhood, of somewhat feeble intellect, came into the house with an excited story of a man who told her that the barn was to be burned down. The building was watched, but no confirmation of the girl's idea was obtained. But next morning she slipped out of the house at breakfast time, and fired the barn herself. We do not think, however, that it is at all certain there was any "hallucination" about it. An insane impulse very likely prompted the invention of the story, as well as the execution of the deed.

Dr. Phillips reports an extreme case of amniotic dropsy. Three "ordinary buckets" of the waters were mopped up from the floor, and at least one more is reported to have been lost.

Dr. Attwood reports cases of sympathetic inflammation of uninjured eyes, respectively seven, twenty, and twenty-one years after the injury to the other organ. Bits of steel from a turning lathe were in each case the cause of the trouble.

Remembering the extraordinary explosion recently occurring in the flour mills of a Western city, the following case has great interest. A "flue," so-called, apparently a conduit for flour or grain, extended from the upper story of the mill down to a distance of thirty feet. Except for the open top, the flue was airtight. For some purpose of repairing, a man lowered himself and a kerosene lamp from the open mouth down towards the bottom. When within six or eight feet of the bottom, an explosion of "flour or gas" took place, "filling the entire space from bottom to top with flame." The man was frightfully burned, but had the rare presence of mind to close his mouth and eyes, thereby avoiding mortal injuries, and loss of sight. On the idea that the explosion was from some gases or other product generated by the working of the mill, as was supposed in regard to the terrible disasters in Minneapolis, it is to be noted that in this case the mill had been idle for several days.

Dr. Mayo contributes a case of purpura hæmorrhagica in a girl of twelve years. Turpentine seemed to relieve and even cure the disease.

3. The sensible and well-written address of President Brice, of the *Alabama Society*, reminds us of the general fact that "hifalutin" is much less prevalent in such efforts than it was in past times. There seems to have been a recognition of the truth that flowery and gushing oratory, however effective and desirable in an after-dinner effort directed to the ears of an assemblage, does not always very well bear the cold lead of the printer.

Dr. Jerome Cochran has an interesting paper on Hermaphroditism. The same writer states and defends the opinion that "puerperal fever" does not exist as an individual entity. If we understand him, he regards such fevers, so-called, as symptomatic, or "surgical"—caused by inflammatory conditions of various organs, or possibly some ordinary fever chancing to appear, and not a specific disease. He presents his argument very forcibly.

As the "Association" constitutes the State Board of Health, a portion of the volume is appropriately devoted to essays upon sanitary and hygienic subjects.

We find here a tolerably full report of a convention, representing thirteen cities on the South Atlantic and the Gulf, which was called together with the view of obtaining more effective quarantine regulations, especially by putting the whole matter under Federal control.

Articles on Endometris and on the Ophthalmoscope make up a creditable, though not a strikingly original publication.

4. From the *Colorado Transactions* we learn that the wonderfully wholesome influences of the mountain air do not protect from that terrible scourge of young families—scarlet fever. No very exact statistics are given, but we infer from the very marked attention given to this disease, that its prevalence in Denver is at least as great as in our Eastern cities. Much discussion was had as to the probable causes of the constant prevalence of the malady; but no one theory of causation met with general acceptance. A committee appointed to consider the subject report the curious fact that adults are more frequently attacked with scarlatina in Denver than in Eastern cities.

Although certain valleys and plains in Colorado experience a very high degree of heat in summer, yet sunstroke is reported to be wholly unknown. We believe the gentlemen who write on this subject are right in attributing to the extreme dryness of the air, their entire exemption from the fatal effects of high temperature. Dr. Lemen quotes in proof of the extraordinary dryness of the atmosphere in the Rocky Mountain States many of the statements which we laid before our readers in a notice of a recent volume of U. S. A. Medical Reports. He suggests the possible advantage, in treating cases of sunstroke, of producing an artificial atmosphere, deprived of its moisture, by the absorbent action of certain chemicals having a strong affinity for water.

Dr. James Reed, of Colorado Springs, considers the influence of the climate and altitude of this health-resort upon the special symptom of pulmonary hemorrhage. It has been believed that the rarefied atmosphere at six thousand feet above the sea promoted bleeding from diseased lungs. From an apparently fair examination of the recorded cases which have come under his notice, the Doctor concludes that this idea is unfounded.

Dr. Beshoar believes early washing of infants to be injurious. Inunction of lard he thinks safer and better during the first eighteen hours of life.

A successful replacing of a uterus after three years' inversion is reported by Dr. Buckingham.

5. Dr. Boyd, of the *West Virginia Society*, reports a successful diagnosis and treatment of an extra-uterine pregnancy. At about three months after conception the cyst formed on the Fallopian tube was punctured by a trocar, causing a profuse discharge of amniotic fluid. A second puncture, a fortnight later, produced an escape of fetid matter and of fragments of the fœtal skeleton. After some two years the discharge ceased, and the wound healed. Very little constitutional disturbance occurred at any time.

Dr. Brownfield gives the general facts of a case where twenty-two years elapsed between the death of a fœtus and its discharge from the cyst on the Fallopian tube.

Dr. Frissell, the veteran surgeon of Wheeling, continues his instructive retrospect of cases. Three cases of "infantile paralysis" came under his notice during three days, all caused by sudden chill, after exposure to great heat. Several cases of cerebro-spinal meningitis, and of different inflammatory lesions, are traced to the same source—imprudent efforts to reduce the bodily heat in extremely hot weather.

Dr. Frissell lays much stress on the earliness of treatment in all forms of "club-foot." He is strongly inclined, too, to value adhesive straps, and plaster-of-Paris bandages, more highly than the expensive paraphernalia of the instrument makers.

6. One of the formal addresses, before the *Pennsylvania Society*, is by Dr. D. Hayes Agnew, upon Errors of Diagnosis. Perhaps only a man of character and

reputation, so assured, could venture to speak so plainly on this subject. Recognizing the fact that many blunders might have been avoided by more careful consideration of all the symptoms, he distinctly states that some mistakes are inevitable; he claims no exemption from the common lot; he expects to make mistakes as long as he lives. "One mistake, to a wise physician," he adds, "is more instructive than twenty successes."

Dr. Curwen, in an article on the care of the insane, expresses the views of humanity and of common sense, as contrasted with some of the foolish conceits and notions of the time. One fact he mentions is peculiarly suggestive: New York State has in forty years spent two and a quarter million of dollars *less* for the lodging and treatment of its insane than has been lavished upon the unfinished capitol at Albany.

Dr. Halberstadt, of Pottsville, urges the more general use of anæsthetics in labour cases.

Dr. Dyer, of Pittsburgh, contributes a careful study of Sympathetic Ophthalmia, with very full references both to the older and the more recent authorities. The same gentleman advocates very earnestly the general adoption by the profession of the metric weights and measures; and he obtained from the Society an endorsement of his efforts to popularize this system.

A very instructive case is described by Dr. Murdoch, in which fracture of the femur was complicated with a dislocation of the head of the bone downward upon the ischium, "in the groove between the lower lip of the acetabulum and the tuberosity." The dislocation was discovered only upon a post-mortem examination, although the patient had been seen by "more than a score" of surgeons, "some of large experience." The complication here noticed is very slightly mentioned even by the most classical writers on the subject of hip-joint troubles. Hamilton and Bigelow gave the writer no aid in the diagnosis. One symptom he believes to have some diagnostic value—a fixedness of the upper fragment.

Dr. Chas. K. Mills directs attention to the danger of confounding the symptoms of psoas abscess with those of sciatica, or other neuralgic ailments.

Prof. Wm. Pepper gives description and illustrative cases of what he regards as "catarrhal inflammation of the bile-ducts." He recognizes both an acute and a chronic form of the disease. Nitrate of silver is warmly recommended as exerting a curative influence on the diseased mucous membrane.

Under the title of the "Address in Hygiene," Dr. Benj. Lee treats at some length of the epidemic of diphtheria which so terribly afflicted Pittsburgh in 1877–8. The mortality during a given period—eight months, we believe—was greater in absolute numbers than ever occurred in Philadelphia, with its sixfold greater population. Sewer gas is the cause here assigned for the prevalence of the disease.

Among the special reports from county medical societies, we notice that Crawford County assigns 19 deaths to diphtheria out of a total mortality of 30. As a standard of measurement we may mention that the deaths from consumption were only five.

The report from Northampton County includes a case of fatal tetanus occurring ten days after treading on a fish-bone. The wound had apparently healed kindly, but death came twenty hours after the first signs of the disease.

From Mifflin County we receive a report of fever cases, seven in one house being attacked, besides three persons having intercourse with the stricken family, and some thirty more in the same village. The reporter regards the disease as typho-malarial, rather than as pure typhoid. While its first cause is considered to have been the drainage of a meadow, formerly flooded, the trouble was believed to be eminently contagious.

Dr. Nancrede contributes an admirable notice of the late Dr. Francis Gurney Smith.

Dr. Bland, of Schuylkill County, met with five cases of typhoid fever in a family of ten, and he attributed the disease to water contaminated with fecal matter. Upon ceasing the use of the suspected well, the disease spread no further.

Dr. Humphreys, of Westmoreland County, from his own experience, speaks warmly in favour of the "bicarbonate of soda treatment" for burns.

<div align="right">B. L. R.</div>

ART. XXVI.—*Clinical Lectures on Diseases of Bone.* By C. MACNAMARA, Fel. Call. Univ.; Surgeon to the Westminster Hospital, etc. 12mo. pp. viii., 298. London: Macmillan & Co., 1878.

VOLUMES of "Clinical Lectures" are, as a rule, hasty reviews of the subjects which they propose to discuss, and greatly lack scientific precision and accuracy; in fact, they seem too often to be mere printed reports of the author's extemporaneous talks to students. In the present instance this is not the case; the preface states that all the lectures have been revised, and a perusal will convince any one of the truth of the assertion. Exception may, perhaps, be taken to the title, which would seem to indicate that the reader is to find clinical (that is, bedside) instruction in the diagnosis and treatment of bone diseases. A careful study of the book, however, shows that the author's intention is to teach the pathology of osseous affections, as illustrated by many specimens and microscopic sections; while the diagnosis and means of relieving such diseases are to be touched upon in the most cursory manner.

Though the reader may be chagrined at not finding that which he sought, he will not be disappointed at the handling of that which he finds. Beginning with remarks on the development and anatomy of bone, which discuss the former almost to the exclusion of the latter, the author at once takes up inflammatory processes, such as osteomyelitis and periostitis; then directs attention to hypertrophy, sclerosis, tuberculous and syphilitic bone disease, necrosis and caries, rickets and mollities ossium; and, finally, concludes with a consideration of tumours of osseous tissue. The chapter on acute osteomyelitis embodies the result of much experience, for it is stated that in the author's practice in Calcutta, it was at one time rather the exception, not to have osteomyelitis subsequent to amputations and compound fractures. His treatment in such cases is similar to that recommended by Fayrer, namely, to amputate at once through or even above the joint situated between the diseased bone and the trunk. As soon as the local and general symptoms show pyæmic infection, the amputation is to be performed without being delayed an hour. He explains the fact that embolic infarctions occur in the lungs more frequently than in other organs as follows: " I believe that in pyæmia the whole of the blood in the body is charged with a deleterious agent, which, whether vital or chemical in its nature, is directly influenced by free oxygen, and meeting with an abundant supply of oxygen in the air-cells of the lungs, emboli are formed in the vessels, and necrosis of the pulmonary tissues, the so-called metastatic abscesses of septico-pyæmia, result" (p. 28).

An interesting and important paragraph relates to epiphysitis, or inflammation of the structures lying between the diaphysis and epiphysis; this diseased condition of course only occurs in the young, and is usually acute in character. Its

differential diagnosis from suppurative arthritis, and its liability to give rise to fatal septicæmia, which may often be averted by free incision down to the epiphysis, invest the subject with no mean degree of surgical interest.   The suggestion that "acute periostitis" so called, occurring only in the young, may be originally an epiphysitis seems to be a well-taken point.

The chapters on tuberculous disease of joints in children are especially interesting.   The traumatic inflammation theory in regard to the etiology of these cases is rejected, and the affection is attributed to a scrofulous constitution.   His argument is based, to a considerable extent, on the infrequency of joint-disease in the native children of Hindostan, though subject to blows and contusions as other children; this immunity is said to be due to the absence of the scrofulous diathesis in inhabitants of that country.   Though agreeing with Gross in regard to the causation of coxalgia, and opposing Sayre's view, he evidently rejects the former's idea of the syphilitic origin of scrofula; he states that syphilis is widely spread in India, but that strumous diseases are rare (p. 106).   As to treatment, he deprecates confinement in hospital wards during the incipient stage, and insists upon open air exercise, with such mechanical appliances as can best be adapted, even allowing some motion of the diseased joint rather than obtaining absolute rest at the expense of hygienic treatment.   His commendation of Hutchison's method of treating coxalgia, as described in the *American Journal of the Medical Sciences* for January, 1879, would, in the opinion of the present writer, be unqualified.

Mr. Macnamara's experience is opposed to excision of the hip and knee for strumous arthritis: but to our mind unjustly, for the operation is certainly very satisfactory when, in poor families, the little patients cannot obtain careful nursing during the many months required for a spontaneous cure.   In certain cases he has obtained good results by opening the joint, and introducing horse-hair drains through holes bored in the end of the bone (p. 125).

His confidence in Lister's antiseptic dressing in compound fractures, etc., seems to be great, but he suggests that there is danger at the present day of discredit being brought upon this method of treatment by those who seem desirous of demonstrating what amount of injury may be inflicted under the protection of antiseptic surgery without risk.   For the treatment of syphilitic bone affections mercury is considered the sheet anchor, and iodide of potassium is regarded as only a palliative to be used when mercury cannot be employed.   The belief expressed (p 240) that union will occur in many cases of intracapsular fracture of the neck of the femur, if the fragments be kept at rest, is opposed to the experience and teaching of the writers of the present day.   J. B. R.

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Art. XXVII.—*The Bearings of Chronic Disease of the Heart upon Pregnancy, Parturition, and Childbed, with papers on Puerperal Pleuropneumonia and Eclampsia.* By Angus Macdonald, M.A., M.D., F.R.C.P.E., F.R.S.E., etc.   8vo. pp. 282.   London: J. & A. Churchill, 1878.

Although of special interest to the practitioner of obstetrics, the subject entered upon by Dr. Macdonald in this work has much in it to attract the general practitioner, even though he may never attend a woman in labour, as a matter of choice.   The question of physical eligibility for marriage, in the sense in which it is presented in this treatise, is one that should be understood and considered by every one who is called upon to treat cases of cardiac disease in female chil-

dren, young women, and older subjects, in view of the fact that marriage may be in remote or near consideration by the parents, or party more directly concerned. Unfortunately the advice given is often disregarded; but it is not always so, especially where the entire truth has been told to parents and subject. It is remarkable how some of the subjects of cardiac disease will escape the immediate fatal issue of child-bearing, and continue to live even after two or more children are born, with heart-sounds that make their living at all a marvel of existence. Organic endocardial derangements, the result of rheumatism in early life, are in many instances not incompatible with a prolonged and reasonably comfortable existence under proper care on the part of the subject; and the duration of life in two parties equally diseased will be often markedly different in either sex, according to the observance or violation of rules calculated, if kept, to preserve and prolong it. We could give some very remarkable instances in illustration, if it was necessary; but no doubt such will present themselves to the mind of the reader.

Dr. Macdonald has illustrated his work by clinical records of thirty-one cases of chronic disease of the heart, viz.: 14 of mitral stenosis; 8 of mitral insufficiency; 3 of aortic insufficiency; 3 of the same, complicated with mitral disease; and 3 of irregular cardiac lesions. He believes with Larcher, Ducrest, Zambaco, Béraud, and Blot, of Paris, whose combined and extensive observations upon women dying in childbed have appeared to establish the fact, that there is in pregnant women a moderate hypertrophy of the left ventricle of the heart, as ascertained by careful weight and measurement in several hundred subjects. He believes that the amount has been in all probability somewhat exaggerated; but that there is no doubt an appreciable growth during the pregnant state. He has not been able to determine, as claimed by Duroziez, any appreciable enlargement by the most careful percussion of the chest, but claims to have discovered, by the sphygmograph, the existence of an increased degree of arterial tension during the lying-in period; a condition which, as a general rule, is most marked at the close of gestation, and begins to diminish after parturition.

The results in the fourteen cases of mitral stenosis are as follows, viz.: Three were primiparæ, all died; four, pregnant for the second time, two died; two pregnant for the sixth time, and one died; the others were in their third, fourth, seventh, eleventh, and twelfth labours, and of these three died. In all, 9 deaths to 5 recoveries. One died during delivery; two immediately afterward; two in thirty-six hours; one in six days; one in fifteen; one in three months; and one in nine. Premature labour took place in one-half of the fourteen cases—a common termination in cases of pregnancy having mitral stenosis. Delivery does not appear, in this form of cardiac disease, to afford very marked relief to the patient, the injury inflicted by the pregnancy, in the form of dyspnœa, pulmonary apoplexy, or œdema, and congestive bronchitis, being inclined to continue.

Dr. Macdonald is an advocate of the use of chloroform in this form of heart disease, claiming that there is more danger from the bearing-down efforts of the patient than from the anæsthetic, the use of which diminishes the parturient effort, and stimulates moderately, the action of the heart becoming more regular and steady under it.

In the eight cases of mitral insufficiency reported, there were four deaths. No. 1 was but slightly affected, and after five easy labours in nine years was in as good health as when married. No. 2 escaped in three labours. No. 3 was taken in labour when affected with phthisis, and died of it in eleven days. No. 4, labour at seventh month, died in three days. No. 5, second pregnancy, labour at term, died of pulmonary œdema and exhaustion in twenty-three days. No. 6, labour at term, recovered, primipara. No. 7, an elderly primipara (38), embo-

lism in ninth month, recovered.   No. 8, under observation in three pregnancies, died in ten days after third.   In but one case was the labour premature, showing quite a contrast with the effect under mitral stenosis, in which it reached fifty per cent.

In the third class, viz., aortic insufficiency, there are six cases recorded, with three deaths.   No. 1, primipara of 23, had rheumatic fever at 15 ; suffered since with shortness of breathing on exertion ; in labour at full term ; pulse very irregular ; disposition to faint ; chloroform administered with safety ; forceps delivery ; mother and child did well ; serious symptoms subsiding as soon as the uterus was empty.   No. 2, also a primipara, 24 ; rheumatic fever three years before ; aortic insufficiency complicated with mitral obstruction ; frequent hæmoptysis, with cough, dyspnœa, and vomiting ; labour at eighth month ; terminated favourably ; died in three weeks of pulmonary œdema and congestion ; mitral opening size of little finger ; aortic valves very defective.   No. 3, primipara, 26 ; same conditions, originating in rheumatic fever five years before ; pain, palpitation, cough, hæmoptysis, vomiting, nephritis, convulsions.   Labour induced, and a seven months' fœtus, some time dead, turned and delivered.   Woman died in three hours.   No. 4, third labour, 40 ; severe aortic insufficiency, the result of acute rheumatism two years before ; premature labour at end of seventh month ; died in three weeks ; lungs engorged and œdematous ; heart weighed $15\frac{1}{2}$ ounces. No. 5, primipara, 34 ; violent præcordial pain, dyspnœa, lips cyanosed ; slight œdema of feet ; labour in thirty-fourth week, with rapid removal of grave symptoms.   No. 6, slight case, primipara of 19 ; premature labour in eighth month ; recovery.

The author explains the beneficial result of delivery as follows :   " It is greatly due to the fact that the down-bearing pains are unquestionably associated with a very greatly intensified aortic pressure, and that this tension acts during the second stage of labour with a threatening effect ; but so soon as the uterus is emptied, the original pressure is restored, and thus a calm of the disturbance is the result."   (p. 166.)

The cases classified by the author as *irregular*, three in number, were all of a complex character, and all terminated fatally.   The whole list of 31 cases shows a mortality of 55 per cent.   The following valuable deductions of Dr. Macdonald give the teachings of the record of cases in short compass :—

" 1.   Chronic heart disease ought to be looked upon as a grave contra-indication of marriage, more especially if it assumes the form of anything approaching to severe stenosis of the mitral, or to serious aortic incompetency ; in such cases we ought, if consulted, to dissuade from marriage.

" 2.   There is less danger in the case of mitral insufficiency ; but still the risk is even then considerable.

" 3.   In all cases, when consulted, we ought not to give our sanction to marriage if, in connection with chronic heart disease, there are any symptoms of cardiac disturbance present, such as attacks of dyspnœa, breathlessness, palpitation on exertion, hæmoptysis, etc. ; and this injunction ought to be the more imperative the younger the patient, and the more recent the acute disorder that has given rise to the chronic lesion.

" 4.   Such patients as are married and have chronic heart disease ought not to be allowed to suckle their children, as that appears to tend to keep up the cardiac hypertrophy, and increase the risks likely to arise from the defective heart.

" 5.   All possible causes likely to produce inflammatory action in the lungs, and all severe exertion, should, if possible, be avoided during the pregnancy, and more particularly during the latter months of it.

" 6.   Premature labour should seldom or never be recommended, because it is so much more likely to do greater harm by disturbing the action of the heart, and the condition of the lungs, than any good it might produce by terminating

the evil effects of the pregnancy. It is always to be remembered that relief of symptoms is not certain after delivery, or indeed anything like certain.

"7. The only conditions which seem to warrant the induction of premature labour are the presence of influences which unduly distend the abdomen, and thus keep the diaphragm in a state of continuous elevation.

"8. The same general principles of management ought to guide us in the case of a patient with chronic heart disease during pregnancy and the lying-in period, as are followed by us in dealing with patients who suffer from heart disease apart from pregnancy.

"9. In almost all the cases I have met with chloroform has been given, and apparently with benefit, during delivery. If carefully administered, I think it cannot but be useful in all cases.

"10. All legitimate means ought to be used to lessen the effects of the down-bearing efforts, and therefore the judicious and timely application of forceps, or in suitable cases the performance of version, is extremely important if the second stage of labour happens to be in any way prolonged. In case of a large amount of liquor amnii, timely rupture of the membranes is calculated to be of great service, as it allows the diaphragm to descend, and thus lessens the embarrassment in the lesser circulation.

"11. Increased experience warrants me in believing that the mortality following pregnancy, complicated by chronic disease of the heart, may be greatly lessened by due precautions during pregnancy and delivery, especially during the latter." (p. 207.)

The balance of the work, 72 pages, is made up of two valuable monographs upon Puerperal Pleuro-pneumonia, and Eclampsia, with a clinical record of two cases of the former, and one of the latter. As the author is a very critical expert in cardiac lesions, his work will be found of most interest to the student of this class of diseases, the cases being given, in many instances, very minutely. In the section on vascular tension in pregnancy as evidence of cardiac enlargement, will be found numerous sphygmographic tracings taken from typical subjects. We can very cordially recommend the work as an important addition to our treatises on diseases of the heart.   R. P. H.

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ART. XXVIII.—*An Essay on the Pathology of the Œsophagus.* By JOHN F. KNOTT. Pp. 225. Dublin: Fannin & Co., 1878.

THIS volume is the successful result of an essay to obtain the prize of the Dublin Pathological Society. In its preface the reader is informed that the author is a medical student, in his third winter of hospital attendance, and, consequently, his effort must largely represent a compilation. Most comprehensive works should be compilations, in addition to whatever else may be included, and in the manner of compiling the merits of the writer are often best shown. The rarity of recent works on diseases of the œsophagus is sufficiently evident to all physicians, and the amount of research necessary for the comparative study of cases, with the exception of those relating to the more common lesions, often renders such study of but little persistence. A bibliographical index alone would, therefore, be warmly welcomed, and an index which gives something else than titles merely, becomes the more valuable in proportion.

This essay is considerably more than an index, and appears at a time when the study of œsophageal disease is receiving a fresh impetus from the appearance of late years of separate papers in foreign and domestic medical journals; and from the recent publication by Zenker and Von Ziemssen of the monograph in the Cyclopædia edited by the latter.

Its table of contents included a chapter on the anatomy and physiology of the gullet, followed by others treating of irregularities in development, of dilatation, inflammation, solutions of continuity (including perforation, rupture, wounds, injuries from acids and alkalies, and digestive solutions), of nervous lesion, as paralysis and spasm, of morbid growths and foreign bodies, with concluding chapters on syphilitic affections and dysphagia.   Such a classification is partly anatomical, in part etiological, and partly symptomatic ; in the absence of a final index, however, it is, perhaps, all the more convenient for being thus mixed.

In the relation of the single chapters to each other, a more logical sequence might have been attained had the sections on œsophageal wounds and foreign bodies more closely followed those on perforation and rupture.   It might also have been more convenient to have established a separate chapter on stenosis or stricture, under which heading a portion of the chapter on syphilitic lesions would readily have fallen ; while syphilitic ulcerations, as representing a specific form of inflammation or of neoplasm, might naturally be looked for in connection with these subjects.   The comparative novelty of this form of disease, however, may be held a sufficient reason for giving it special consideration.   In treating separately of dysphagia, more or less repetition becomes necessary.   As this symptom of œsophageal disease is not only the most important, but also the most frequent, there can be no question of the convenience of including under this head a consideration of the various lesions which may produce the effect, their more detailed consideration being readily sought for elsewhere.

In speaking of the diameter of the normal œsophagus, attention might have been called to the effect produced by the tracheal bifurcation, in diminishing the calibre of the gullet.   Although the smallest diameter is to be found at the level of the cricoid cartilage, the impaction of foreign bodies lower down, and the well-known frequency of tumours in the region referred to, indicate that the functional diameter of the tube does not progressively increase till the diaphragmatic opening is reached.

One effect of the incomplete development of the œsophagus is not noticed, and as it plays so important a part in the cause of death of the infant, it should occupy a prominent place in the consideration of the several malformations.   The effect is consequent upon attempts at feeding.   All food is not simply regurgitated by the sufferer, but a portion often enters the lungs, and a pneumonia follows, which may involve the greater part of both lungs.   This event becomes all the more inevitable when food or stimulants are injected into the pharynx, or when the infant's nostrils are closed that it may be urged to open its mouth for the reception of fluids.

Mention is omitted of a very frequent form of œsophageal dilatation, that resulting from traction, which may even become of serious importance as the seat of ulceration or perforation.   Such traction is usually dependent upon chronic inflammatory processes, with consequent contraction of the tissues lying outside the œsophagus, especially at the tracheal bifurcation, and which evidently bear an intimate relation to changes taking place in the bronchial glands.

Objection may be made to the including of aphthous patches under the results of croupous inflammation.   The two conditions are so distinct anatomically and clinically that such a confounding is more than an oversight.   This confusion is frequently met with in the description of cases, owing to the appearance of broad, and often long, whitish patches of false membrane, but the morphological distinction between the vegetable growth and the coagulated fibrine is very readily made out.

The author calls attention to a form of perforating ulcer of obscure origin, but quite distinct from ulcerations elsewhere found in the digestive canal.   The exist

ence of such an idiopathic ulceration is based upon the reports of a limited number of cases, which do not furnish satisfactory evidence of the view presented. The recognized causes of ulceration and perforation are sufficiently numerous to explain the origin of most of the ulcers; errors of observation are frequent, many examiners are incompetent, and very strong evidence, much more convincing than appears in the cases reported, must needs be presented before an idiopathic form of perforating ulcer can be admitted among the well-known varieties.

In thus pointing out some of the peculiarities of this volume, attention should again be called to the unusual circumstances of its origin. Its faults are those almost necessarily connected with the period of development attained by the writer, a medical student. At such a stage authority occupies so prominent a position that recorded cases are used as if they were satisfactory evidence, and a great deal is omitted which time, opportunity, and, perhaps, training might have permitted a place. As the work of a medical student, the book presents unusual merit, and compares very favourably with works of a similar character prepared by men of fuller maturity. The writer shows zeal, industry, and considerable discrimination, and his task has been accomplished with much care and taste.   R. H. F.

ART. XXIX.—*The Pathological Anatomy of the Ear.* By HERMANN SCHWARTZE, M.D., Professor in the University of Halle on the Saale. With the author's revisions and additions, and with the original illustrations. Translated by J. ORNE GREEN, A.M., M.D., Aural Surgeon, Boston City Hospital; Clinical Instructor in Otology in Harvard University. 8vo. pp. 174. Boston: Houghton, Osgood & Co., 1878.

THIS is a most excellent scientific work, and the subject is so divided as to make the book a very easy one to read and understand. A typically normal ear is rarely found on dissection, for, as we are informed, in most cases abnormal conditions of congestion and secretion are discovered, especially in the middle ear. These are to be regarded either as occurring at the time of death or *post mortem.*

The diseases most frequently affecting the ear are the acute exanthemata, typhus and typhoid fever, acute and chronic catarrh of the nose and naso-pharynx and their results, tuberculosis, diseases of the heart, syphilis, puerperal fever, and chronic alcoholism.

When treating of *caries* and *necrosis* of the temporal bone it is stated that these processes attack the temporal more frequently than any other cranial bone, the points of preference being the mastoid portion: less frequently the petrous part, and least frequently the internal meatus or the porus acusticus internus. Necrosis of this bone is less common than caries. The pages 12–19, which contain the author's digest of necrosis and caries of the temporal bone, with a short sketch of the ravages of abscess of the brain, should be carefully studied by every practitioner of medicine. On page 14 the author but reiterates the statement of the deplorable fact that caries of the temporal bone is generally the secondary result of an acute or chronic suppuration of the soft tissues of the ear, which has extended to the surrounding bone; seldom is it the result of suppurative ostitis or primary periostitis, and on page 17 he states that the relation between caries of the temporal bone and abscess of the brain, is that the former is the primary lesion and the latter the secondary lesion, thus forming a most direful sequence between a too often neglected ear-ache, and a surely fatal disease.

Of course it must be admitted, as is stated by the author, "that abscess of the brain and disease of the ear may occur simultaneously from the same cause, trauma, as has been shown by Albers."

In this connection it will be well to bear in mind that which is recalled by the statements of Professor Schwartze, that abscess of the brain may be unsuspected, and also that in two instances, once by Von Trœltsch, and once by Magnus, an abscess of the brain has been found on the side opposite to the affected ear. To explain this peculiarity, metastasis, tuberculosis of the lung (by infecting the brain from a gangrenous cavity), and an accidental coincidence have been urged. The rule is, however, that but too plainly the aural disease has produced the cerebral abscess: even the doubtful cases are extremely rare. Sometimes, as our author states, instead of an abscess, a tumour of the brain is found in connection with chronic otitis. In referring to *fracture of the base of the skull* and the implication of the ear therewith, it is stated that in some instances "brain substance may be forced through the meatus externus." "Inflammation of the brain and its meninges, dependent upon fracture of the petrous bones, may not ensue until several weeks after the injury." This is an important point to remember.

Under *malignant tumours* of the temporal bone, which as primary occurrences are rare, primary epithelial cancer is alluded to, three cases of which the author has observed. In all of these observed by Dr. Schwartze the origin of the growth was the tympanic mucous membrane.

The *external auditory canal* is next considered, and an important physiological fact is presented, viz. :—

"In childhood, up to the fourth year, an ossification gap, closed merely by connective tissue, is found normally in the anterior lower wall, to which Von Trœltsch first directed attention. The knowledge of this fact is of importance to avoid mistaking it for a carious opening. In adults, remains of this opening are met with in exceptional cases. During purulent inflammations of the middle ear, ulcerative destruction of the skin over this spot of deficient ossification may occur, and through the opening an extension of the inflammatory process of the meatus may reach the parotid gland and the lower jaw."

The author reminds us of another important fact, viz. : the common name, "catarrh of the external meatus has no anatomical justification." Since catarrh can exist only where there is mucous membrane, and as in the external auditory canal there is no mucous membrane, there can be no true catarrh. Profuse suppuration of this canal, we are told, is unfavourable to the growth of fungi; hence otomycosis is most usually found in an ear which has been, but is no longer, the seat of active inflammation. An eczema of the auditory canal may extend over the membrana tympani. "A not infrequent complication of eczema of the meatus is mucous catarrh of the middle ear, without perforation of the membrana tympani." Regarding furuncle of the auditory canal our author states that its most common seat is the anterior lower wall of the meatus. This, the circumscribed inflammation of the skin of the canal, is a very trivial matter when compared to *diffuse* inflammation of the skin of this part of the ear.

The latter may extend from the cutis and involve the subcutaneous cellular tissue, and "if not relieved by *early* and *deep* incisions the inflammation may go on to gangrene, extensive destruction, disease of the bone, or even to purulent thrombosis of the sinuses and to septicæmia."

Foreign bodies in the form of masses of sebum, epithelium, etc., in this canal may, besides the secondary inflammation of the skin, produce atrophy or ulceration of the membrana tympani from pressure. More commonly, by forcing the drum-head inwards, they favour adhesion between the membrana tympani and the inner wall of the tympanum. They may also greatly enlarge the calibre of the

canal.   In one instance Von Trœltsch observed fatal facial erysipelas result from the irritation set up by one of these masses in the ear.

On page 53, Cholesteatomata of the meatus are alluded to.   It is known that Toynbee described large numbers of these collections in the meatus, as sebaceous tumours.   He ascribed to his "sebaceous tumours" an enveloping membrane of connective tissue, which has its origin on the floor of the meatus, near the drum-head.   His description, therefore, of "sebaceous tumours" closely corresponds with that now given of cholesteatoma.   It may be that these collections do originate in the canal from true sebaceous tumours or wens.   These by breaking down would produce a condition of the meatus analogous to that found in the so-called cholesteatoma.   But the latter term only describes the resultant appearances, not the cause.   A wen in the auditory canal is exactly like a wen in any other part of the skin covering a cranial bone, and it is well known that a wen over the calvarium will erode the bone, and finally grow upon the dura mater,[1] or by finally breaking down produce results similar to the so-called sebaceous tumours of the meatus.   Judging by analogy it would seem highly probable that so-called cholesteatoma of the canal is in reality nothing more than a broken-down wen.   In referring to injuries of the meatus, it is stated "that limited fractures, which do not extend to the base of the skull, sometimes occur in the extremely thin upper wall of the meatus from contusion of the head.   This may produce injury of the brain and evacuation of the brain substance from the ear without death necessarily resulting."

The author is not accurate in his statement that he was the first to call attention to the growth of vegetable parasites in the human ear : his first paper, as is stated on p. 55, of the work before us, was published in 1865.   But Mayer[2] and Paccini,[3] both preceded him in describing the growth of fungi in the human ear.

The author makes the interesting statement that a constant hyperæmia of the manubrial vessels of the membrana tympani is a sign either of "inflammatory irritation in the drum-membrane or tympanic cavity or else a symptom of habitual congestion of the head."

Perforations of the membrana tympani are said to be most common in the anterior lower quadrant of the membrane in the intermediary zone between the manubrium and the tendinous tympanic ring.   The largest and most rapid destructions of the membrane occur in scrofula, tuberculosis, and especially in scarlatina.   Prof. Schwartze considers duplicate perforations of the membrana tympani common, while Prof. Politzer holds an opposite opinion.   Our author presents no statistics for his opinion, which, in view of the rather exceptional position taken by him, would seem desirable.

So far as our experience goes, multiple perforations of the drum-head are rare in this country, and by no means common in Germany.   The cribriform condition of the membrane alluded to by the author is entirely unknown in our experience, but Prof. Schwartze now inclines to the view, first advanced by Bonnafont, that "not only in tuberculosis pulmonum and in miliary tuberculosis, but also in scarlatina, with pharyngeal diphtheritis and pyæmic conditions, the membrana tympani may be simultaneously perforated at different points.   These multiple perforations are at first very minute, but rapidly enlarge, and finally coalesce into a large opening, perhaps from emboli."   On this subject the author quotes C. E. E. Hoffmann.[4]   When considering the membrana flaccida or Shrapnell's mem-

[1] Camille Misset.   Etude sur la Pathologie des Glandes sébacées.   Paris, 1872.

[2] Muller's Archiv, p. 401, 1844.

[3] "Supra una Muffa parasita (Mucedo) nei condotto auditivo esterno."   Florence, 1851.

[4] Archiv f. Ohrenheilkunde, IV. S. 277.

brane, *i. e.*, the part of the membrana tympani above the folds, the author disappoints us, in slighting, as it appears to us, the pathological conditions often found in this part of the ear. They are not only grave as to the injury to hearing, which they produce, but they are difficult to cure. The perforations in this part of the drum-head are generally, if not always, the sign of deep-seated disease in the upper part of the tympanic cavity. Otological writers in this country have contributed largely to this subject.

The *Tympanum* commands our attention as that part of the ear most "frequently involved in pathological processes."

The three forms of catarrhal inflammation affecting the middle ear are the *serous*, the *mucous*, and the *purulent*. While these forms clearly defined may and do occur, the author thinks the transition forms are more common. "The very highest degrees of catarrhal swelling of the tympanic mucous membrane are capable of complete retrogression, the membrane resuming its cobweb-like delicacy, and moulding itself accurately to the osseous walls and contents of the tympanic cavity." It is of the highest importance to note that there is also a *croupous* and *diphtheritic* inflammation of the tympanum, unknown until described by Wendt.

Of *new growths* in the tympanum, polypi are common, appearing usually as fibromata and as myxomata : rarer forms are fibroma and gumma of the chorda tympani. Angioma has been found in the ear by Dr. A. H. Buck, of New York. Other new growths in this cavity are named, as, exostosis, hyperostosis, cysts, epithelial cancer, osteosarcoma, and tubercle. The author reminds us that the *Eustachian tube* has a very narrow, slit-like mouth in children. This fact shows how easily this part of the tube partakes in swelling of the pharyngeal mucous membrane in childhood, and why it is that the tube becomes so easily closed in the young. The author denies the existence of the so-called valve of the tube, heretofore described as a normal condition. The valve-like duplicature of the mucous membrane "is pathological, and due to a relaxation or wrinkled swelling of the mucous membrane." On p. 135 a caution is given, respecting the Eustachian tube, in the statement "that traumatic inflammations of the Eustachian tube sometimes occur after surgical operations in the naso-pharynx, and from incisions into the tubal orifice during *resection of the upper jaw*, etc."

Ulceration of the pharyngeal mouth of the tube occurs in syphilis : ulcerations here and on other parts of the naso-pharynx "can often be recognized by a rhinoscopic examination, where the usual inspection of the pharynx, without a mirror, would raise no suspicion that an ulcerative process existed." According to Rüdinger the tube is liable to abnormal gaping throughout its entire length with atrophy of the musculus dilatator tubæ in *old persons*. Cicatricial closure of this tube, at its pharyngeal end, has been observed after diphtheria, variola, and scrofula. New growths appear in this tube in the form of polypi and polypoid tumours, syphilitic excrescences, caseous nodules in miliary tuberculosis, and exostosis in the osseous part.

Complete absence of the *mastoid portion* is found with other malformations in the temporal bone in congenital deaf-muteness. It is said that in 600 skulls examined by Hyrtl, the occiput entered into the formation of the mastoid cells in three cases. Catarrhal inflammation of the pneumatic cells of the mastoid bone may exist as an independent affection without extending to the tympanum, and without perforation of the membrana tympani. Dr. Zaufal's case is alluded to, in which an isolated suppuration in the mastoid cells took place without caries and without extending to the tympanum, but led to phlebitis of the sinuses and death.

Periostitis externa, and caries and necrosis are next considered, together with

eburnation or sclerosis; the latter is termed a common result of chronic inflammations of the middle ear, especially of the purulent variety. *New growths* in the mastoid portion are of various kinds; prominent among them are lymphomatous tumours, concretions of a chalky consistency in the mastoid cells from syphilis, polypi, cholesteatoma, and *primary epithelial cancer.*

The diseases of the *inner ear* and auditory nerve are considered under malformations, anæmia, hyperæmia, hemorrhage, inflammation and its results, caries and necrosis, new growths and injuries. There is also an extremely interesting and valuable contribution to the diseases of the auditory nerve, between its central origin and its entrance into the labyrinth.

The entire labyrinth may be wanting or imperfectly developed. "A congenital absence of the auditory nerve is extremely rare, and is never found except with absence of the labyrinth." Anæmia of the labyrinth, not easily diagnosed, has been assumed to be the cause of disturbances of function of the ear, following depleting diseases. It is said to result also from contraction and embolus of the arteria auditiva interna, and also from aneurism of the basilar and carotid arteries.

Hyperæmia of the labyrinth is given as "the result of disturbances in the vasomotor innervation in hysterical persons."

In regard to the so-called Menière's disease, and the very hypothetical primary inflammation adduced by Menière to account for the case given by him, and on which an absurd and incorrect nomenclature has been established and widely circulated, "it is doubtful whether it was anything more than a simple hemorrhage."

It will not be out of place to say that aural vertigo should be the general term for all cases of vertigo arising from aural irritation. Menière's disease, if it means anything, means disease of the semicircular canals, according to Menière himself; and yet this name is applied loosely to the vertiginous symptoms which may arise from irritation in the ear, anywhere from the meatus to the auditory nerve.

It is well known that the labyrinth cavity has been found filled with pus in cerebro-spinal meningitis, but this is emphatically a secondary process, a neuritis descendens, from the meninges to the labyrinth.

Caries and necrosis of the labyrinth are next considered, and some very interesting cases of detachment of the cochlea referred to, one of which, that of Niemetschek, of Prague, records the expulsion of the necrotic labyrinth through the nose.

The "diseases of the auditory nerve" is a most carefully prepared digest of the data on these points, enriched by the author's experience in several matters of obscurity and rarity, as, for example, the result produced in the ultimate fibres of the auditory nerve by tumours on its trunk, and amyloid degeneration of the nerve, the effects on it produced by gummata of the brain or base of the skull, basilar meningitis, aneurism of the arteria basilaris, hydrocephalus internus, and other intracranial processes.

It is with unfeigned pleasure we have read this book, and with a similar feeling we congratulate the author on his admirable work, and the profession on the acquirement of such a book for guidance in pathology. The author has been very fortunate in his translator, and to Dr. Green readers of English owe a debt of thanks not easily discharged.   C. H. B.

ART. XXX.—*The Surgery of the Face.* By FRANCIS MASON, F.R.C.S.,
   Surgeon and Lecturer on Anatomy at St. Thomas's Hospital.   8vo. pp. 170.
   London: J. & A. Churchill, 1878.

THIS volume is made up of the three Lettsomian Lectures of 1877–78, before
the Medical Society of London. They were originally printed in the *Lancet*, and
are now gathered into a book of most readable type, and with one hundred illus-
trations. Having been thus already before the profession, the lectures will require
less notice than if they were now first published.

If Mr. Heath can make a most readable and instructive book of large size on
the jaws alone, it would seem to be folly to attempt to compress into three lectures
the surgery of the whole face. Yet this is the vain endeavour of Mr. Mason.
The lectures embrace respectively the diseases, the injuries, and the deformities
of the face, and about *fifty* topics are treated, or rather touched upon. Many, if
not most of them, are so briefly noticed, that it would have been better had they
been entirely omitted, and the space and time so gained given to a more thorough
discussion of the remaining subjects.

Yet the book is a good one, especially for two reasons. Mr. Mason has been
exceedingly industrious in collecting and correlating very many detached cases
(though chiefly English cases), which bear on his subject, to which he has added
no inconsiderable number of his own, and has thus furnished the surgeon with
much material for the study of the subject; and he has grouped, compared, and
contrasted the various methods of operating for nævi, hare-lip, cleft palate, defi-
cient lips, nose, etc. Moreover, these are all admirably and fully illustrated as
well as described. To avoid scars on the face, a matter of no small moment, he
urges that the *rubber* adhesive plaster be used where sutures can be avoided, or if
they cannot be avoided, that they be of fine silk. The reviewer has, for some
time, used the Japanese bead silk, a very fine but quite strong silk, and with great
satisfaction. The plan recently proposed by Dr. Packard, of very oblique instead
of perpendicular incisions, would find in the face one of its happiest applications.
Should the book reach a second edition, we trust that the author will allude to
this, and also to the use of the dental engine in operations on the nose, jaws, etc.,
a matter now attracting considerable attention.

The style of the book is, in general, excellent, and singularly free from the
petty errors most authors are apt to commit occasionally; but even the ever-con-
venient "noun of multitude" will hardly excuse such an expression as "the
Fellows may try it on *their* own *person*" (p. 89).   W. W. K.

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ART. XXXI.—*Zur Behandlung einfacher Fracturen der Extremitäten mit Gyps-
   Hanf-Schienen.* Von Dr. F. BEELY. 8vo. pp. 75. Königsberg, 1878.
   *The Treatment of Simple Fractures of the Extremities by Splints of Hemp and
   Plaster of Paris.* By Dr. F. BEELY.

THE author of this monograph believes that narrow splints, made of strands of
hemp fixed by plaster, are an improvement over the ordinary plaster of Paris dress-
ing applied in a circular manner. He discusses first the manner in which fracture
dressings act, and the diagnosis of fractures; in which section he very properly
deprecates violent and persistent efforts to obtain crepitus, because the manipula-
tion is apt to tear any bands of periosteum which may be holding the fragments

together. After some further general remarks he specifies the components of the hemp and plaster dressing, and then lays down the rules for its application and removal, and for the after-treatment of the case. Finally the form and manner in which he applies the splints for each special fracture are fully detailed, and illustrated by numerous demonstrative lithographic plates.

The gist of the thing is simply this. After the fragments have been placed in apposition, and the member put in the proper attitude, long strands or bundles of hemp, as thick as the little finger, one and a half or two feet long, and saturated with wet plaster, are laid upon the limb longitudinally, and allowed to dry. By this means splints accurately fitting the contour, and in width about one-third the circumference of the limb, are expeditiously manufactured. If hemp is not convenient, tow or flax can be used with the same result. Of course woven fabrics, as has been demonstrated by others, make equally good splints. After the super-imposed layers of hemp and plaster become dry and hardened, an ordinary retentive roller is applied.

We have, as is seen, in this dressing a splint accurately moulded to the part, and acting as the felt splints, used in this country, which are adapted to the contour of the limb by being softened with hot water. In the hemp and plaster dressing wire loops can be fastened at various points, if it is desirable to suspend the broken limb, by fixing the ends of the wire between the layers of hemp. Continuous weight extension can be used at the same time by means of adhesive strips and the ordinary pulley.

The method of dressing fractures here described was employed in 313 cases under the personal supervision of the author, who therefore believes his opinion as to its merits to be founded on sufficient experience to render it worthy of acceptation. The use of the plaster dressing applied circularly is more common in Germany than in America, and as a consequence our author compares his modified plaster dressing solely with that, paying little or no attention to the claims of wooden, felt, or card-board splints. The author's aim is to establish its superiority to the circular plaster dressing, which the reviewer is willing to admit in many instances, though he does not consider the plaster splints as cleanly or as readily adjusted as some other appliances.

It is claimed that these splints are cheap; that the materials are easily obtained of good quality and in large quantity; that no cotton padding is required because they fit the limb so accurately; that the dressing can be applied tightly or loosely without being removed; that inspection of the injured extremity is permitted, and that removal of the dressing is effected easily and rapidly. Most of these advantages are presented to meet the objections of those favouring the circular dressing, and hence few of them apply to splints of moulded felt or cardboard, which allow equally well inspection of the injury, ease of adjustment, and rapid removal. Very minute directions are given (pp. 12–20) regarding the selection of materials and the treatment after the splints have been applied, which will suggest themselves at once to any practical surgeon.

In fractures of the humerus and forearm Dr. Beely applies the splint on the outer and dorsal aspect of the limb, and at times introduces a wire loop at the wrist for the attachment of the sling passed around the neck. For fracture of the tibia or femur an anterior splint with numerous rings for suspension is employed; sometimes permanent extension is combined with this dressing, giving much the same effect as the wire splint devised by Hodgen of St. Louis. When deemed proper the fractured limb can be treated by the postural method, and the desired position retained by moulding suitable splints. Again, pelvic bands or shoulder caps can be made, when the line of fracture is near a joint, in order to render the dressing firmer. It is also easy and, it would seem, very judicious to

employ this dressing in resections of joints by constructing bracketed splints from stout iron hoops fixed in the layers of hemp.

From the description given it will doubtless be admitted, that if any form of plaster dressing is to be employed in the early stages of fractures, whilst frequent inspection and changes in the firmness of the pressure are necessary, the modification of our author is a decided improvement; but the time requisite to apply the splints properly, the inconvenience attending the mixing of the plaster, and its subsequent chipping and breaking render other forms of splints preferable in the majority of instances.   J. B. R.

ART. XXXII.—*Lectures on Bright's Disease of the Kidneys, delivered at the School of Medicine of Paris.* By J. M. CHARCOT, Professor of the Faculty of Medicine of Paris, Physician to the Salpêtrière, etc. etc. Collected and published by Drs. BOURNEVILLE and SEVESTRE, Editors of the Progrès Medical, and translated, with the permission of the author, by HENRY B. MILLARD, M.D., A.M. 8vo. pp. 100. New York: William Wood & Co., 1878.

THE translator of this excellent little monograph was led, as he intimates, to undertake his work by the feeling that there is no other book upon the subject which gives, '' with so much clearness and well-chiselled outlines (*sic*), the salient and practical features of the disease.'' The conviction which Dr. Millard thus labors to express will, we think, be shared by most of his readers, and if the volume before us had been so extended as to include the therapeutics of Bright's disease, it would probably have proved a formidable rival, for professional favor, to the larger and, in this respect, more complete treatises of Dickinson and Grainger Stewart. Even in its present form the brochure is valuable enough to be well worth the study of every busy practitioner who has a new case of albuminuria to manage, and it will of course find a place upon the library shelves of every one who aims to keep himself *au courant* with the literature of the day in regard to maladies of the urinary organs.

The classification of Bright's disease adopted by Prof. Charcot is substantially that with which most are familiar through the writings of Grainger Stewart (who by the way credits Virchow with first suggesting it), namely, the histological one into, first, parenchymatous nephritis, or disease of the epithelium lining the tubules; second, interstitial nephritis, or inflammation of the intertubular connective tissue; and third, amyloid degeneration, or infiltration with the so-called amyloid or lardaceous material. To the description of these three forms, preceded by two admirable chapters on the normal structure and functions of the kidneys, the volume is mainly devoted.

The anatomy and histology of the organ are very fully and distinctly explained, not only in the text but by the aid of several wood-cuts, which illustrate the arrangement of the tubuli contorti, the loops of Henle, and the tubes of Bellini, with unusual clearness. Our author follows Heidenhain, in describing the epithelium of the convoluted tubules, as being filled with rod-shaped striæ, converging like radii toward the centre of the tube; these, when examined in a line with their axes, presenting the appearance of granules, and giving rise to the cloudy aspect so generally observed. The histological account is full and accurate (as far as our present knowledge extends) to a remarkable degree, requiring but little preliminary knowledge to render it available even to medical students. The relative narrowness of the loops of Henle, in their ascending limbs, as compared with the calibre of the tubuli contorti, is specially emphasized, and its important

practical deduction, in regard to the diagnostic value of some kinds of tube casts in the urine, pointed out in the following terms:—

" In a general way, the clinical importance of urinary casts has been greatly exaggerated. They are not, as they have been called, 'faithful messengers, announcing to the clinical observer the anatomical condition of the kidneys,' or 'mirrors reflecting the various renal lesions.' Formed in the ultimate parts of the apparatus of the tubuli uriniferi, they can only in any case furnish information upon the condition of these parts. I have previously maintained the fact, that the casts formed in the convoluted tubes can but very seldom pass into the urine."

In regard to hyaline casts, M. Charcot correctly states that they may even be found in the urine during health, and are quite common in cases of jaundice, when they seem to be the result of some action of the bile acids upon (or in) the blood, as Leyden has demonstrated their occurrence in animals whose veins had been injected with biliary acids. They are also met with, as is well known, in diphtheria, and certain acute febrile affections, and, on the other hand, may occasionally though rarely be entirely absent during the course of true Bright's disease.

Under the head of physiological action of the kidneys is given the best exposition which we have yet seen in English, of Heidenhain's very ingenious experiments for proving that the watery portion of the urine is secreted by the glomeruli, whilst the saline ingredients are eliminated by the epithelium of the tubuli uriniferi.

Probably the nearest approach to a real *raison d'etre* for the translation, however, is to be found in the systematic effort made by Prof. Charcot, to link together the clinical history, the microscopical and chemical characters of the urine, and the pathological histology of the kidneys, in each of the different forms of Bright's disease. The knowledge which the methods pointed out in this portion of the volume will afford, respecting difficult examples of renal malady, must often, we think, prove invaluable to practitioners of medicine anxious to avail themselves of every ray of light which can by any possibility contribute to illumine obscure cases of these affections among patients entrusted to their care. Thus, for instance, our author tells us that in fully-developed interstitial nephritis, the quantity of urine is generally increased above the normal average, instead of being diminished, as in parenchymatous nephritis. In the former of these affections, hypertrophy of the left ventricle without valvular lesion, is rarely absent, whilst in the latter it seldom occurs. On the other hand, dropsy is unusual in interstitial, and common in the parenchymatous form of the complaint. The amount of albumen in the former is very small, and that of urea nearly normal in interstitial nephritis; yet in it uræmic accidents, such as habitual dyspepsia, persistent headache, uræmic amaurosis, and, in its stage of fullest development, paralysis agitans, epileptic and even apoplectic symptoms appear; whilst none of these phenomena are, as a rule, met with in the parenchymatous variety of morbus Brightii.

From the abstracts already given, it will be seen that we deem this work of Prof. Charcot clear, concise, and yet complete, within its somewhat limited scope; the great fault being, as already stated, an entire absence of any account of the treatment suited to the various forms of Bright's disease. This, if associated with the lesions, signs and symptoms as carefully and skilfully as the latter have been grouped together by our learned author, could scarcely fail to have made the work a necessary one to almost every practitioner of medicine; and we trust that the next edition will appear enriched with at least one more lecture devoted to the therapeutics of the disorder under consideration.

Among the minor omissions, we regret to find that no mention is made of Klebs' discovery, that in certain inflammatory and often actually diphtheritic processes in the bladder, vegetable organisms wander up the ureters and renal pelves into the urinary tubules. Here the plugs of micrococcus spores, which are readily recognized after death, set up a form of nephritis, which frequently proves fatal, and must certainly be recognized as one of the varieties of Bright's disease.

The duties of the translator have been generally well performed, but we are sorry to notice evidences of haste and carelessness, which occasionally rise to the magnitude of actual blemishes upon the work. Thus, for example, we are surprised to observe Dr. Millard stating, on p. 37, that the urine of interstitial nephritis is of "feeble" (not robust) "specific gravity;" and profoundly astonished to see the title of M. Cornil's essay before the Concours, presented when applying for the position of *Professeur Agrégé*, translated on p. 31 by the words "Thesis on aggregation"!!

The paper, type, and press-work, are creditable to the publishers, and two excellent chromo-lithographs greatly add both to the appearance and the usefulness of the book.   J. G. R.

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ART. XXXIII.—*An Atlas of Human Anatomy. Part I., 4 plates, 4to. With an Explanatory Text.* By R. J. GODLEE, F.R.C.S. 8vo. pp. 56. Philadelphia: Lindsay & Blakiston, 1878.

THIS is an exceptional work in one respect, viz., the author is both the anatomist and the artist; a combination of talent rarely seen in our profession since the time of Sir Charles Bell. He is to be greatly envied for the ability he has shown, and to be congratulated on the success he has achieved in both departments. It is also a guarantee for the fidelity of the plates—a guarantee which is confirmed by their careful inspection. We do not know anything as to the author's ability to teach the students of University College, but if we may judge from the present work, he ought to be one of the best of anatomical teachers, for in few departments are clear and quickly-drawn blackboard sketches of such rare value as in Anatomy. The more elaborate and minute a picture is the less is it adapted for teaching purposes. It will answer admirably for careful study, but a bold, and, it may be, even rudely drawn outline sketch, which the student can watch as it grows rapidly on the blackboard under his eye, is the one from which he will carry away the most lasting impressions. In such sketches Mr. Godlee ought to be a master.

The work will consist of about 52 quarto plates, issued in parts, with an octavo volume of some 300 to 400 pages. The plates will illustrate many of the unusual dissections, and will include, of course, all parts of the body. Part I. has to do only with the neck. There are two figures in each plate, executed by chromo-lithography, with a reference-text to each plate. We regret the method Mr. Godlee has adopted for distinguishing the parts. Muscles are indicated by Roman capitals; arteries by small italics; veins by Greek small letters; nerves by Arabic numerals; and miscellaneous parts (the "human warious" of Silas Wegg) by typographical symbols, such as the *, ¶, †, =, etc. Had he adopted Mr. Heath's simple method of lines terminating in the parts to be indicated, and numbered with odd numbers on the right-hand side, and even numbers on the left, prolonged and sometimes futile search for an obscure letter or point would have been obviated, and ready reference made certain. The only objection to it is the slight marring of the plates by the lines.

As to the text but little save in way of praise can be said. The dissection is first clearly indicated, and then the parts are described in groups; the muscles first, followed by the arteries, veins, nerves, etc. We have observed but few errors. On p. 22, the triangle in which the thoracic duct is found is said to be bounded by the clavicle, omo-hyoid, and *thyro*-hyoid, instead of *sterno*-hyoid muscle. On p. 42, when both bellies of the omo-hyoid contract, its action is said to be on the hyoid bone; but no allusion is made to its chief function as a tensor of the deep fascia to prevent pressure on the deep veins in inspiration, an action which can often be verified on the living, especially on thin, aged subjects. The omission of all allusion to the comparatively easy ligation of the lingual artery above the hyoid bone in the triangle formed by the digastric and the hypoglossal nerve, is unfortunate.   W. W. K.

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Art. XXXIV.—*Preliminary Course Lectures on Physiology*. By James T. Whitaker, A.M., M.D., Prof. of Physiology and Clinical Medicine in Medical College of Ohio, etc. Crown 8vo. pp. xii., 288. Cincinnati: Chancy R. Murry, 1879.

This little book is very different from what we ordinarily expect to find in an elementary treatise. Instead of being a hasty and incomplete summary of the more salient points of physiology, a style of work which is only suitable for those who desire the most superficial information, Dr. Whitaker's lectures are only elementary in that they treat of the "foundation facts and principles on which the stately edifice of physiology is built," while they are in all respects in accord with the latest researches.

They therefore serve as an excellent introduction to more extended study, and are admirably suited to the wants of a first course medical student. The book contains twelve lectures on the influence of physiology on practice, on the conservation of force, on the origin of life, and the evolution of its forms, and on protoplasm, bone, muscle, nerve, and blood; the chapters on bone, muscle, and nerve being particularly good.

The paper, binding, and type are excellent, and the book is unusually free from typographical errors, unless a few such expressions as *cloacum*, *cilum*, arrectores *pili*, *synomim*, etc., may be regarded as such oversights. In subsequent editions, which no doubt will be required, we trust to see the omission of numerous poetical interpolations which are neither instructive nor ornamental.
                                                                    R. M. S.

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Art. XXXV.—*Recent Editions of Works on Surgery*.
  1. *The Principles and Practice of Surgery*. By John Ashhurst, Jr., M.D., Professor of Clinical Surgery in the University of Pennsylvania. Second edition, enlarged and thoroughly revised. 8vo. pp. 1040. Philadelphia: Henry C. Lea, 1878.
  2. *A Manual for the Practice of Surgery*. By Thomas Bryant, F.R.C.S., etc., Surgeon to, and Lecturer on Surgery at, Guy's Hospital, etc. Second American from the third and enlarged English edition. Imp. 8vo. pp. 945. Philadelphia: Henry C. Lea, 1879.

1. To one who will carefully compare the recently published second edition of Ashhurst's Surgery with the first edition published in 1871, it will soon be appa-

rent that the author has much revised and enlarged the original work. Though only occasionally have previously expressed opinions been decidedly modified, almost every paragraph bears witness to thorough study of recent contributions to surgical literature, and thoughtful consideration of new views that have during the past eight years been entertained upon questions of pathology and treatment.

For example, we find allusions to Gordon's and Moore's writings upon the mode of production of, and cause of deformity in, fractures of the lower end of the radius ; to Bryant's line ; to wiring the broken patella ; to fat-embolism ; to Sutton's fulcrum ; to Allis's test for sciatic dislocation ; to nerve-stretching in cases of neuralgia and tetanus ; to Duret's theory of concussion of the brain ; to Martin's bandage ; to the use of the Esmarch bandage in the treatment of aneurism ; to subcutaneous osteotomy ; to Judson's investigations upon lateral curvature ; to the recent operations for genu valgum ; to the rectal exploration and its dangers ; to linear rectotomy ; to the removal of the lower end of the rectum ; to the use of the elastic ligature in cases of fistula in ano ; to aspiration of the bladder ; to Battey's operation ; to Porro's operation ; to laparo-elytrotomy ; to cholecystotomy ; to Bigelow's litholapaxy. The immovable apparatus in the treatment of fractures is noticed at some length ; frequent references are made to the statistics given in the published surgical volumes of the *History of the War of the Rebellion*, and Culbertson's " Prize Essay on Excision of Joints ;" tables of cases of ligation of the important arteries have been introduced ; the antiseptic dressing, as at present made, is described somewhat in detail ; a new paragraph is introduced upon the anatomical origin of cancer.

That, as already stated, the author has modified some of his previously expressed opinions is shown, *e. g.*, by the declared prognosis in cases of gunshot fracture of the vertebræ, "very unfavourable" in the first edition, now "less unfavourable than has been commonly supposed ;" again by his estimate of the value of ligation of the common iliac, it being originally stated that the record, "though gloomy, warrants a resort to this proceeding in cases in which milder measures fail," while now it is written that it "hardly warrants a resort to this proceeding unless in very exceptional cases ;" again by the paragraph on the statistics of wrist-joint excisions, originally pronounced "not very favourable," now "quite favourable."

We notice that, as in the first edition, Prof. Crosby is spoken of as of New Haven instead of Hanover ; and the famous Gage "tamping-iron" case is credited to Prof. Bigelow, instead of to Dr. Harlow, who originally reported it.

2. The very recent date at which we received the second American edition of *Bryant's Surgery* prevents our doing anything more than contrasting some of the views therein expressed with those upon the same subjects given in Ashhurst. The present is likely to be known hereafter as the "antiseptic period," and on taking up a new book, or a new edition, one naturally turns at once to the paragraphs on the treatment of wounds and the causes of certain diseases.

Dr. Ashhurst evidently is, as in 1871, far from being a faithful disciple of Mr. Lister, and is still very skeptical as to the "alleged superiority of the antiseptic method ;" nor has Mr. Bryant apparently seen good reason for changing the opinion expressed in the first edition of his work. He says that the "Lister practice" ought to have a fair trial, and be honestly tested ; but insists upon it that we should first "have the facts," and regrets (not to say complains), as does Prof. Ashhurst, that the distinguished Clinical Professor of Surgery at King's College Hospital has not, though repeatedly requested so to do, published "the results of his practice as a whole."

The antiseptic catgut ligature is by one (Ashhurst) regarded as "quite safe, at

least for arteries ligated in their continuity," but not so good for wounded arteries, or those divided in amputation, as the ordinary silk ligature; its fault being that "it disappears without dividing the external coat of the artery, and thus does not securely occlude the vessel." The other (Bryant) regards it as "a safer ligature than the silk or hempen, as it does not, like the latter, of necessity require an ulcerative process for its discharge."

Neither of the authors, it may be concluded from what they have written, has any faith in the "germ theory" of the production of pyæmia and its allied diseases.

Respecting the use of the Esmarch bandage we find a rather favourable opinion expressed by both authors, though by both the danger of troublesome after-bleeding is distinctly mentioned.

Due notice is taken in each work of the "immovable dressing" in cases of fracture (the plaster of Paris being preferred); and it is in both recommended, not as a primary, but as a secondary application, because of the danger attending its early employment; a danger which we believe is reduced to a minimum when the Bavarian splint is used, a splint described and figured by both authors.

For fracture of the shaft of the femur Ashhurst recommends the weight-extension apparatus with long side splints, and Bryant the double splint; the former declaring emphatically that he has never seen a cure without shortening; the latter stating that of 31 consecutive cases treated, 18 recovered without any shortening. When the patient is a young child, Bryant advises that the case be treated with the limb flexed at a right angle with the pelvis.

In both works forcible and prolonged taxis in cases of hernia is, of course, strongly reprobated; Ashhurst giving a little longer period of time, during which efforts at reduction may be made. We cannot but think that for the majority of practitioners throughout our country, Bryant's time is the better one, for even the greatest bungler will not be very apt to do much harm in from two to five minutes; and we are forced to believe by what we have seen and heard that the taxis is every year "putting out of order" a great many people.

The vexed question of "what anæsthetic shall we employ?" is in both works left as unsettled as in the earlier editions, and this notwithstanding the fact that within these years very much has been written upon the subject, and some little addition made to our positive knowledge as to how the several agents differ in their action.

In reviewing the first editions of these Surgeries we expressed our opinion as to their value, and have only to say at this time that each work, as it now appears, is better, and will be found to be more serviceable to students and general practitioners, than as it was originally presented. It is by no means true, as has been charged, that one is but a mere compilation, and the other superficial in character, and written in most wretched English. Undoubtedly, however, one author has well and judiciously selected, and the other will never be chosen as a model of clear and elegant diction.   P. S. C.

ART. XXXVI.—*An Introduction to Pathology and Morbid Anatomy.* By T. HENRY GREEN, M.D. Lond. Third American from the fourth revised and enlarged English edition. 8vo. pp. 331. Philadelphia: Henry C. Lea, 1878.

SINCE the publication of the second American edition of Dr. Green's work only two years have elapsed, and the appearance of a fourth English edition is evidence that the book has proved acceptable to the reading part of the profes-

sion. This edition is very little larger than the preceding one, but in the preface the author says that all the chapters have been revised, and the number of illustrations considerably increased. In this, as in the last edition, the chapter on pulmonary phthisis is the best of all, but the other important chapters are fairly apace with the advances in pathological knowledge that are constantly being made. In the chapter on inflammation in scrofulous constitutions, there is an exceedingly good wood-cut of scrofulous inflammation of a bronchus in a child, which shows the extensive infiltration of the bronchial walls with large cells.

In the chapter on tuberculosis of the lung. the illustrations are exceedingly good, and some of them a great improvement on their predecessors. The chapter on inflammation of common connective tissue, though brief, is well epitomized from our knowledge on the subject, but is not so well illustrated as some other work in the volume.

We regard this work as especially valuable to the student, on account of its clearness of style, conciseness of statement and general accuracy, and the numerous illustrations largely enhance its usefulness. We, therefore, cordially commend this third edition as better, in some respects, than the other editions, and well worth perusal.　　　　　　　　　　　　　　　　　　　　　C. S. B.

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Art. XXXVII.—*On Rest and Pain. A Course of Lectures Delivered at the Royal College of Surgeons.* By John Hilton, F.R.S., F.R.C.S., etc. Edited by W. H. A. Jacobson, F.R.C.S., Assistant Surgeon to Guy's Hospital. Second edition. 8vo. pp. xii., 299. New York: William Wood & Co., 1879.

This great book is too well known to the medical profession to call for an extended notice from us. It has long since taken its place among medical classics, and, from the beauty and simplicity of its style, with the number and value of the suggestions it contains, will ever rank as one of the most notable works produced by the pen of a surgical writer. Yet, while too well known to call for an analytical presentation of its contents to our readers, we cannot resist the temptation to dwell upon some of the characteristics which have made it famous.

It is now an old book, and from that fact alone it will be considered as unworthy of notice by many who expend their energies upon current literature, with the idea that that only is fresh. Yet, as we have carefully read over its pages, the conviction has forced itself upon our mind that in this volume of Mr. Hilton's are contained the germs of many modern improvements in treatment, and that the men who have carefully studied and judiciously followed out the hints contained in it, have both added to the resources of our art and found the result of their study a most profitable investment.

We are acquainted with no book which so forcibly and clearly demonstrates the important bearing of an accurate anatomical knowledge of nervous distribution upon the difficulties of surgical diagnosis as this one, and we feel persuaded that no one can work through the somewhat dry anatomical details it contains, without being convinced of their value as applied to the elucidation of many obscure cases. Of course it will be said that Mr. Hilton, like other lecturers, narrates principally those cases which support his theories, but both the honest simplicity which marks his style and the appeals which his demonstrations make to the common sense of the educated surgeon, go far to carry conviction to the fair minded one.

The work of Mr. Hilton forms the first volume of " A Library of Standard Authors," which is to consist of twelve volumes, to be issued monthly only to those who subscribe for the whole number, at the rate of one dollar each. The

muslin binding is exceptionally good. The wood-cuts, one hundred and nine in number, are coarse, but sufficiently clear, the paper is very fair, but the print is not sufficiently leaded to make the reading of it pleasant.   S. A.

Art. XXXVIII.—*Naval Hygiene. Human Health and the Means of Preventing Disease, with Illustrative Incidents, principally derived from Naval Experience.* By Joseph Wilson, M.D., Medical Director U. S. Navy. Second edition. 8vo. pp. 274. Philadelphia: Lindsay & Blakiston, 1879.

Of all men who live by manual labour none fare as badly as those who toil upon the waters at home or abroad. Sailors of all nations are more imperfectly and irregularly fed, clothed, and lodged than their countrymen who are labourers on land. Whether employed in a naval service or commercial marine their condition is comparatively worse than the labouring classes on shore in whatever pertains to personal comfort, health, and peril in time of peace as well as of war.

Generally speaking the class of sailors is constituted of ignorant men who lack the faculty of self-control in a greater or less degree, men who constantly need watchful and kindly guidance of superiors to enable them to gain a very moderately comfortable subsistence by their labour. Very many of the class besides being ignorant are wanting in docility, and are therefore incapable of learning to do properly the simplest things, and never become even moderately expert in the vocation. Whatever they do is awkwardly done, and on this account they are often harshly or unjustly treated by official superiors, who are rarely endowed with more than average intelligence, and sometimes possess brutal or tyrannical tempers which are too often cruelly manifested with impunity. Besides those who are naturally dull of comprehension, there are some who are lazy, or who are addicted to vicious and disorderly ways, and take to the sea to avoid jails and correctional institutions on shore. But whatever be their faults and defects of character sailors are nevertheless brothers, men who form a large and important class of the population, and seem to be entitled to as much humane consideration as the criminal inhabitants of prisons. To ameliorate the condition of these unlucky people afloat, and to render them more respectable and self-respecting everywhere, is a very desirable though not easily achieved purpose. The task includes the difficult work of making official superiors comprehend the methods best calculated to readily manage such thriftless, inconsiderate, and viciously disposed men as are found in ships' companies of both private and public vessels, and to secure from them the largest amount of approved labour at the least cost.

This work of Dr. Wilson is well conceived to contribute very much to this end, and is well calculated to attract the thoughtful attention of those who can control many of the remediable evils which inure to the sailor's life in spite of the very many humane efforts made to remove them. Speaking of the sleeping berths for sailors on board of merchant vessels Dr. Wilson says, p. 22 :—

" The triangular space forward which the crew inhabit, the forecastle, is for the most part really shocking. It is seldom visited by the officers, and is generally filled with disgusting emanations from the untidy persons of those who occupy it. . . . . " We sometimes hear complaints of the scarcity of sailors, but under present circumstances we might as well complain that there are few suitable candidates for the penitentiary. Though such laborers may be profitably used, it is to be hoped that the number of men who reach this degree of misery may not be increased."

The work of Dr. Wilson is founded on a naval experience of more than a third of a century, very nearly nineteen years of which have been passed at sea, and

is benevolently designed to instruct those whose position on board of ships enables
them to exercise a controlling influence for good or ill over rational methods of
preserving health, such as captains, "executive officers," and others, rather than
as a complete or systematic treatise on naval hygiene for the exclusive use of
medical officers. The routine incidents of a cruise on the north Atlantic station,
in 1860, from the moment the officers and crew are placed on board the ship until
they are finally discharged, are in succession made occasion of carefully considered
comments on every thing relative to the preservation of health.

After an "introductory," which states that hygiene treats of the means of pre-
serving health, and that health consists in the normal performance of the functions
of all the organs of the body, and that they may be disturbed through the influ-
ence of the natural forces, heat, light, electricity, he proceeds first to notice the
general forms of the several varieties of war and merchant vessels; and the
divisions of their hulls into many apartments for different purposes are so plainly
described that landsmen may understand them. The sources of disease ascriba-
ble to construction or plan are mentioned, and means of obviating them are sug-
gested. He believes that "the metals used in ship-building are in many ways
beneficial to health," and "that health is constantly improving through their in-
fluence." The colour of the paints applied to various parts of the ship, inside
and out, is of considerable importance to the health and comfort of her inmates;
but the selection may be determined on military reasons nevertheless, or by the
exigence of nautical fashion.

The reason why the number of good and reliable seamen is inadequate to the
demands of commerce and the navy is that the discomforts which are incident to
sea life, and the wretchedness which is occasionally added by caprice, neglect,
and indifference, lead the best men to escape from the service at the end of the
first cruise, unless they have been well treated or advanced in accordance with
their merit. Much is now being done with encouraging success, to improve the
condition and character of the typical sailor, but the time when young men will
choose this as they do other laborious employments is perhaps far distant.

A man falling overboard is made the occasion to describe the methods of resusci-
tating drowned persons; and the rolling and pitching of the ship at sea leads to
comments on sea-sickness. Remarks on the social condition of a crowd of men,
strangers to each other when first placed on board, introduce a consideration of
nostalgia and its causes and treatment.

Dr. Wilson advises incidentally the habitual wearing of the cummerbund or
flannel bandage as an efficient protection against dysentery in hot climates. He
is of opinion that sailors should not be discouraged in the use of tobacco, or de-
prived of "mending day," which is well described.

The several articles which constitute sailors' rations are considered some-
what in detail, and methods of cooking them are given, with remarks on the
arrangement of meals and nutrition. The methods of preserving fresh various
articles of diet for use at sea are described. Canned meats and desiccated vege-
tables do not find much favour in the naval service. Sources of supply of potable
water, the manner of its preservation at sea, purification, filtration, the aëration
of distilled water, alcoholic and other drinks, are duly considered.

About fifty pages of the work are appropriated to zoology and botany, in-
cluding remarks on poisonous fishes and descriptions of some tropical fruits.

The arrival of the ship at Vera Cruz affords the author an opportunity to
speak of "liberty on shore" and the perils of health to which the men are ex-
posed. The importance of ventilation is sufficiently well explained, and methods
of cleaning ship are mentioned.

In this connection attention may be directed to the annual report of Commo-
dore R. W. Shufeldt, Chief of the Bureau of Equipment, to the Secretary of the

Navy, Oct. 1877. He states that in one class of ships the air-space allotted to each officer is 324 cubic feet, and to each man 58 cubic feet, in another class 273 cubic feet to each officer, and 68 cubic feet to each man; and in a third class, 1158 cubic feet to each officer, and 81 cubic feet to each man. He says "a ship may be ever so perfect in its construction and armament, she loses her significance as a man-of-war unless manned by a vigorous crew. It is simply impossible to expect men to retain their health, if compelled to berth and mess in the dense and mephitic atmosphere which is the natural result of their crowded quarters. . . . . Ventilation of our ships has never received the attention it imperatively demands. I respectfully urge upon the Department the propriety of appointing a board of medical officers to report upon the subject, and to devise a method whereby the object may be assured." This report has received no more attention than reports of many medical officers on the same subject, made from time to time.

The return of the ship, touching by the way at Havana, to be immediately equipped for war, gives the author opportunity to speak of quarantine, the effects of sudden transition from hot to cold climates and the reverse, preparation for battle, transportation of wounded, epidemics, endemics, etc. etc.

The above summary is sufficient to indicate the scope and general nature of the work, which we commend to those for whose information it was especially written. The conscientious, painstaking character of the author, and his long experience give assurance of the reliability of his statements.

The present edition has been carefully revised, and about forty pages added. The text is illustrated by four coloured lithographic plates and thirty-four well-executed wood-cuts.   W. S. W. R.

Art. XXXIX.—*Hydrocele: its Several Varieties and their Treatment.* By Samuel Osborn, F.R.C.S. 18mo. pp. vi., 84. London: J. & A. Churchill, 1878.

This little book is an amplification of two articles printed in volumes v. and vii. of St. Thomas's Hospital Reports.

Mr. Osborn's aim seems to have been to present to his readers a conspectus of the views of others, with a summary of generally approved remedial measures, rather than to bring new facts or observations before them. Indeed, after again perusing the book, we have been unable to find one statement which is new, or that can be construed into an addition to surgical knowledge. The medical student who by some accident has never happened to hear the subject lectured upon, may find in this volume an expansion of the statements contained in some text-books, but nothing more; while the intelligent surgical practitioner will inevitably conclude that, while reading this monograph, he has been engaged with twice-told tales.

It may however be urged, that there are many different tastes in this world, and that some prefer to search for information in various little tracts like the present, rather than to examine the contents of more bulky treatises. This class of readers will find Mr. Osborn's work exactly suited to them, for the book is well written, and contains just what they will find in more condensed form in many modern surgical text-books. His account of encysted hydrocele is more nearly exhaustive than other portions of the book, and the anatomical details which Mr. Osborn gives are exact and clearly stated.

Mr. Osborn writes simply and pleasantly, and the book is very well printed, while its general appearance corresponds with the excellent reputation which justly belongs to the publishing house from which it issues.   S. A.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

Arrest of Development in the Sternum.

At a late meeting of the Brooklyn Anatomical and Surgical Club (*Proceedings of Med. Society of the County of Kings*, Jan. 1879), Dr. CHARLES JEWETT presented the sternum removed from the body of the late Dr. E. A. Groux, who died October 15, 1878, aged 45 years, with an account of his case, which during life had been an object of medical interest throughout the world.

The sternum was an example of complete median fissure of the bone with no other failure of development. At the autopsy an incision was made through the skin and superficial fascia which opened directly into the anterior mediastinum. No other structure bridged the space between the lateral halves of the bone. The heart was found normal in size and shape, and normally situated, except that the position was slightly higher than usual, the apex presenting at the level of the upper border of the fifth rib. The right auricle lay wholly to the right of the median line. The position of the right ventricle corresponded precisely with that of the pulsating tumour observed by the committee of the New York Pathological Society (*Amer. Med. Monthly*, Jan. 1859), just beneath the integument in the medio-sternal space and extending from the second to the fourth intercostal space and from the median line to the left edge of the fissure.

In looking at the sternum it is observed that were the lateral halves united a slight deficiency in width would be seen at the upper portion of the manubrium, perhaps one-half inch. The lower segment of the gladiolus would be found somewhat smaller than usual. Otherwise there is no deficiency of bony substance.

The articulations of the fifth, sixth, and seventh costal cartilages were found to deviate somewhat from their normal relations to the lower segment of the gladiolus. While the fissure divides the entire bone, the lateral portions of the lower segment of the gladiolus articulate with each other. Each articular surface is covered by a cartilage, and the two parts of the bone are bound together by external ligamentous bands. The articular cartilages of this joint blend below with the ensiform appendix.

The vertical depth of the fissure from the level of the sterno-clavicular articulation to the bottom of the cleft is four inches. Width at the level of the first costal cartilage, one inch. Width at widest part, 1.4 inch.

The specimens has been carefully prepared by Dr. Pilcher, for the Museum of

the Anatomical and Surgical Club, to which it has been formally donated by the widow of Dr. Groux.

Dr. Groux is supposed to have possessed the power to arrest the action of the heart at will without producing any other disturbance of his usual condition. On taking two or three quick inspirations, by an effort the cardiac movements were apparently stopped for about twenty seconds, and he never deemed it prudent to prolong the effort beyond that time. The committee of the New York Pathological Society "were not able to see that he did anything else than to stop the pulse at the left wrist, the circulation continuing everywhere else," and they attributed this power to stop the pulse at the left wrist to the unusual mobility of the clavicle, by which the subclavian artery was compressed at the top of the chest.

Appended to the paper is a bibliography of the malformation.

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The Eustachian Tube.

The action of the palatal muscles on the Eustachian tube is the subject of an interesting lecture delivered by Professor LUCAE, to the Physiological Society of Berlin, and published in a recent number of Virchow's *Archiv*. A short time ago, in the same journal, Lucae recorded some observations on an individual whose nasal cartilages had been destroyed by lupus, which observation went far to decide the much-disputed question of whether the Eustachian tube is permanently open or closed. They confirm the statement of many previous observers that the tube cannot be regarded as permanently open. It is rather loosely closed, and opens in different individuals with different degrees of readiness on the occurrence of variations in the pressure of air in the pharynx and tympanic cavity respectively. During the act of swallowing, the tube is, as Michel maintained, closed, and it is also closed during phonation. The observations seemed to show that the view that the tensor opens the tube during the act of swallowing is erroneous, although the muscle probably assists in opening the tube at the end of the act of deglutition, as soon as the action of the levator is over, and the soft palate again falls. During deglutition, phonation, aspiration, and forced breathing, the raised palate presses together the lips of the opening of the Eustachian tube, and thus air is forced towards the middle ear.

In his recent lecture Lucae has given the results of his investigation of two other cases in which the nasal cartilages were destroyed. The changes to be observed in the mouths of the Eustachian tubes during movements of the soft palate were exactly the same as those seen in the former case. When the palate was raised the lips of the tube were pressed together, and were separated when the palate fell. No movement could be perceived in the anterior lip, but the cartilaginous rim was each time moved from the anterior lip towards the posterior wall of the pharynx, whilst the floor of the tube was pushed into the triangular space thus formed. During this action, if there was a drop of fluid in the mouth of the tube, it was moved towards the middle line of the body, especially during the powerful elevation of the palate which occurs during the act of swallowing. The defect of the alæ nasi was in one case so great as to permit the introduction of a small laryngoscopic mirror, by which a direct view of the mouth of the tube was obtained; and it was seen that during rest and ordinary respiration there was only a small furrow, which, when the soft palate was raised in deglutition and phonation, became almost obliterated. On the ground of observations on the pressure on the middle ear during deglutition, Lucae thinks it highly probable that external closure of the tube is associated with an internal dilatation, either by simple mechanical inflation or simultaneous action of the tensor palati *seu* dilator tubæ, but no direct proof of

this has yet been given. The closure of the tube, when the palate is raised, is no doubt the reason why, when fluid is injected into the nasal chamber—by which a reflex water-tight closure of the posterior nares by the palate is produced—no liquid gets into the Eustachian tube, unless the patient swallows while the douche is being employed. But why, it may be asked, should fluids pass into the tube during the act of swallowing if the tube is closed ? It must be remembered that deglutition is a complex action. Physiological treatises are silent on the question of the exact time at which the palate is raised. Lucae has endeavoured to answer the question by a method devised by Czermak for the study of the movements of the palate during phonation. A curved wire was so placed in the nasal cavity that the curved portion lay upon the soft palate, the movements of which were shown by the projecting part of the wire, to which a long straw was attached. It was found that, as Gentzen observed in a case in which the palate was exposed by the removal of an orbital tumour, the palate was raised progressively in the passage through the series of vowels—a, e, i, o, u. At the commencement of deglutition the palate was raised as high as in the pronunciation of u, and the fall of the palate, and therefore the opening of the mouth of the Eustachian tube, coincided with the contraction of the constrictors of the pharynx and the last portion of the act of deglutition proper. It does not therefore succeed deglutition, but occurs during the last portion of the act, and hence the passage of liquids at this time into the tube from the nose. These observations have led to certain contrivances for maintaining the closure of tube during the employment of the nasal douche, so as to avoid the risk of the awkward accident of the passage of liquid into the middle ear. Fraenkel, for instance, recommends that the patient should be made to pronounce the vowel u, while Störck advises water to be kept in the mouth ready to be swallowed without being actually swallowed, which leads to elevations of the soft palate only. The observations show also that the end of the act of deglutition is far more favourable than its commencement for the forcible inflation of the Eustachian tube and tympanic cavity by the method of Politzer.—*Lancet,* Jan. 4, 1879.

MATERIA MEDICA AND THERAPEUTICS.

On the Biliary Secretion of the Dog with reference to the Action of Cholagogues.

Dr. WILLIAM RUTHERFORD, Professor of the Institutes of Medicine in the University of Edinburgh, has presented a report on this subject to the Scientific Grants Committee of the British Medical Association (*Brit. Med. Journ.,* Feb. 8, 1879), of which the following is the summary of results obtained.

1. In a curarized dog that has fasted eighteen hours, the secretion of bile is tolerably uniform during the first four or five hours after the commencement of the experiment, but falls slightly as a longer period elapses. Its composition remains constant.

2. Croton-oil is a hepatic stimulant of very feeble power. The high place assigned to it by Röhrig was probably the result of his imperfect method of experiment.

3. Podophyllin is a very powerful stimulant of the liver. During the increased secretion of bile, the percentage amount of the special bile solids is not diminished. If the dose be too large, the secretion of bile is not increased. It is a powerful intestinal irritant.

4. Aloes is a powerful hepatic stimulant.   It renders the bile more watery, but at the same time increases the excretion of biliary matter by the liver.

5. Rhubarb is a certain, though not a powerful, hepatic stimulant.   The bile secreted under its influence has the normal composition.

6. Senna is a hepatic stimulant of very feeble power.   It renders the bile more watery.

7. Colchicum increases to a considerable extent the amount of biliary matter excreted by the liver, although it renders the bile more watery.

8. Taraxacum is a very feeble hepatic stimulant.

9. Scammony is a very feeble hepatic stimulant.

10. Gamboge is an intestinal, but not a hepatic, stimulant.

11. Castor oil stimulates the intestinal glands, but not the liver.

12. Calomel stimulates the intestinal glands, but not the liver.

13. Euonymin is a powerful hepatic stimulant.   It is not nearly so powerful an irritant of the intestine as podophyllin.

14. Sanguinarin is a powerful hepatic stimulant.   It also stimulates the intestine, but not nearly so powerfully as podophyllin.

15. Iridin is a powerful hepatic stimulant.   It also stimulates the intestine, but not so powerfully as podophyllin.

16. Leptandria is a hepatic stimulant of moderate power.   It is a feeble intestinal stimulant.

17. Ipecacuan is a powerful hepatic stimulant.   It increases slightly the secretion of intestinal mucus; but has no other stimulant effect on the intestine.   The bile secreted under the influence of ipecacuan has the normal composition.

18. Colocynth is a powerful hepatic as well as intestinal stimulant   It renders the bile more watery, but increases the secretion of biliary matter.

19. Jalap is a powerful hepatic as well as intestinal stimulant.

20. Sodium-sulphate is a hepatic stimulant of considerable power.   It also stimulates the intestinal glands.

21. Magnesium-sulphate is an intestinal but not an hepatic stimulant.

22. Potassium-sulphate is a hepatic and intestinal stimulant of considerable power.   Its action on the liver is, however, uncertain, probably owing to its sparing solubility.

23. Sodium-phosphate is a powerful hepatic, and a moderately powerful intestinal stimulant.

24. Rochelle salt is a feeble hepatic but a moderately powerful intestinal stimulant.

25. Ammonium-chloride stimulates the intestinal glands, but not the liver.

26. Dilute nitrohydrochloric acid is a hepatic stimulant of considerable power.

27. Mercuric chloride (corrosive sublimate) is a powerful hepatic stimulant, while it is a feeble intestinal stimulant.   Although calomel is an intestinal but not a hepatic stimulant, excitement of the liver as well as of the intestinal glands results when mercuric chloride and calomel are administered together.

28. Calabar bean stimulants the liver, but not powerfully, unless it be given in very large doses.

29. Atropia-sulphate antagonizes the effect of Calabar bean on the liver, and thereby reduces the hypersecretion of bile produced by that substance.   It does not, however, arrest the secretion of bile, and, when given alone, does not notably affect it.

30. Menispermin does not stimulate the liver.   It slightly stimulates the intestinal glands.

31. Baptisin is a hepatic and also an intestinal stimulant of considerable power.

32. Phytolaccin is a hepatic stimulant of considerable power. It also slightly stimulates the intestinal glands.

33. Acetate of lead, in large doses, somewhat diminishes the secretion of bile, probably by a direct action on the liver.

34. Ammonium-phosphate is a moderately powerful hepatic stimulant of the liver. It does not stimulate the intestinal glands.

35. Tannic acid does not affect the secretion of bile.

36. Hydrastin is a moderately powerful hepatic stimulant, and a feeble intestinal stimulant.

37. Juglandin is a moderately powerful hepatic and a mild intestinal stimulant.

38. Sodium-benzoate is a powerful hepatic stimulant. It is not an intestinal stimulant.

39. Ammonium-benzoate stimulates the liver, but not quite so powerfully as the sodium-salt of benzoic acid. It does not stimulate the intestinal glands.

40. Benzoic acid stimulates the liver, but, owing to its insolubility, its action is less rapid and much less powerful than that of its alkaline salts.

41. Sodium salicylate is a very powerful hepatic stimulant. It does not notably stimulate the intestinal glands.

42. Sodium-chloride is a very feeble hepatic stimulant.

43. Sodium-bicarbonate has scarcely any appreciable effect as a hepatic stimulant, even when given in very large doses.

44. Potassium-bicarbonate feebly excites the liver, and that only when given in very large doses.

45. Potassium-iodide has no notable effect on the biliary secretion.

46. Sulphate of manganese does not excite the liver, though it is a powerful excitant of the intestinal glands.

47. Morphia has no appreciable effect on the secretion of bile, and does not prevent the stimulating effect of such a substance, as sodium-salicylate.

48. Hyoscyamus does not notably affect the biliary secretion, and does not interfere with the stimulating effect of such a substance as sodium-salicylate.

49. Pure diluted alcohol does not affect the biliary secretion.

50. Jaborandi is a very feeble hepatic stimulant.

All the above conclusions are based on experiments performed on the dog, and have no reference to any observations made on the human subject.

The Action of Pituri on Man.

Dr. Sydney Ringer contributes to the *Lancet* (March 1, 1879) a short article on this interesting drug, which is derived from Duboisia Hopwoodii, and belongs to the order Solanaceæ, but differs strangely from the other medicinal plants derived from this family. From twelve observations made with pituri on man, Dr. Ringer finds that it produces faintness, pallor, giddiness, tremor, hurried and superficial breathing, increased frequency of pulse, perspiration; in larger doses, salivation, drowsiness, convulsive twitchings, spasmodic rigidity of the extremities. In small doses, internally administered, it contracts, in large it widely dilates the pupils; locally applied, it contracts and then widely dilates the pupils. It antagonizes the action of pilocarpine and muscarin on the frog's heart.

Whilst retaining many of the properties of solanaceous plants, pituri differs in some striking particulars. Like atropia, hyoscyamia, daturine, and duboisia, it produces general weakness and drowsiness, dilates the pupil, quickens the respiration, increases the frequency of the pulse, and antagonizes the action of muscarin on the heart; but it differs from these alkaloids in producing salivation and

increased secretion from the skin, in this respect corresponding to muscarin and pilocarpine, with which substances it is further allied, for muscarin produces giddiness, fainting, prostration, stupor, breathlessness. Internally given, it contracts the pupil; applied locally to the eye, it dilates the pupil; whilst, like pilocarpine, it produces muscular trembling and accelerated pulse.

Mr. Tweedy saw the patients and examined the eyes while under the influence of pituri. He reports as follows: "I have little to add to your account of the effect on the eye of the local application of a solution of pituri, except to note that, although the pupil was widely (not fully) dilated, the accommodation was almost unaffected. The patients could read quite well, and they did not complain of much mistiness. Pituri seems to be a weak mydriatic; strong enough to dilate the pupil for a few hours, but not sufficient to impair the action of the ciliary muscle. Except the smarting, a weak solution of atropine—say one-thirtieth of a grain to an ounce—would produce the same symptoms as the one per cent. solution of pituri, perhaps even including the preliminary contraction. Ophthalmoscopically I discovered nothing."

The Therapeutic Value of Salicylic Acid.

Professor BARTELS (*Deutsche Medic. Wochenschrift*, No. 32–35) states that salicylate of soda acts as powerfully as salicylic acid, although containing only 0.68 of the free acid; that no deep-seated lesions of the intestinal mucous membrane occur even after large doses; but that eruptions and loss of appetite frequently occur in non-feverish patients after the use of the free acid.

The action of salicylic acid is twofold, antipyretic and specific. The antipyretic action may be observed in any febrile patient. In the hectic fever of phthisis it has been given with varying results. In some cases the action was slight or the drug was not well borne, whilst in others it was given for months, producing cessation of the daily rise of temperature, with wonderful restoration of strength and of weight. In typhoid fever, the nerve symptoms became so severe during its administration that it was discontinued. In other fevers it was found to be much less powerful in its action than quinine. Diminution in the frequency of the pulse, profuse sweating, dryness of the mouth, and slight albuminuria, also result from its employment. In diabetic patients, large doses produced severe nervous symptoms; staggering as in intoxication, delirium, and even maniacal violence. These bad effects often restrict the use of the salicylic preparations to small doses, thus decreasing its value as an antipyretic.

Dr. Bartels has employed salicylic acid as a specific in acute rheumatism and in diabetes mellitus, with great success. In the former there was a steady fall of temperature, with remission of the symptoms, and in a few days convalescence; good results were obtained also in chronic rheumatic arthritis. In diabetes mellitus large doses were given, which brought on brain-symptoms, but there was great reduction in the amount of sugar in the urine, and increase in the weight of the body. He concludes that the salicylate of soda has no prophylactic action against infectious diseases, for a diabetic patient, whilst taking large doses of this drug, was seized with erysipelas and died.—*London Med. Record*, Dec. 15, 1878.

Physiological and Therapeutical Effects of Adonis Vernalis.

As it had been noticed that the effects caused by an extract of adonis vernalis were similar to those produced by digitalis, and that in some cases of compensatory troubles the action of the heart could be restored by it, even if digitalis had proved unsuccessful, BUBNOFF undertook, at Professor Botkin's instigation, to make a series of experiments on frogs, which he subsequently published in the

St. Petersburger Med. Woch. (January 6, 1879). The results of his experi-
ments are as follows : A diluted solution of the extract. adonidis vernalis aquosum
was injected into the crural lymph-bag of a frog, the heart of which had previously
been laid bare. It was then noticed, after a certain lapse of time, which in most
cases was in indirect proportion to the dose which had been injected, that the
ventricle began to contract more strongly. During the diastole the surface of the
latter was covered by swellings of different size, resembling aneurisms. These
disappeared entirely during the diastole. In a few minutes the contractions of
the ventricle decrease in number, though not in strength, and the swellings be-
come much larger. Later on the ventricle often remained for several seconds in
systole, the sinus venosus and the auricles were considerably dilated and worked
unsuccessfully ; at last, after two to four contractions of the auricles a small
quantity of blood passed into the ventricle, which again contracted spasmodically,
and this was repeated for a few minutes. At last the heart assumed a very
characteristic shape, the ventricle was strongly contracted and sometimes very
pale, the atrium and sinus venosus were considerably dilated. The contractions
of the heart and sinus went on for some time, then stopped, and the heart ceased
to beat, still retaining the shape already noted. The frog generally survived the
operation, and jumped about, although his heart had ceased beating. If the
heart in this state is stimulated by pricking the ventricle with a needle, it responds
at first by a few contractions of the atria and the ventricle ; after a while the
prick only calls forth a few useless contractions of the atria. In short, after a
certain time, stimulation by pricking has not the least effect in causing the heart
to pulsate. The heart retains its very characteristic shape in spite of all stimula-
tions or irritations which may be applied, such as hypodermic injections of atropin,
faradic currents, section of the vagus nerve on both sides, etc. All these experi-
ments, combined with the clinical experiences, lead to the supposition that adonis
vernalis contains a poison analogous to digitalis, which strongly affects the heart,
but has certain peculiar properties, one of them being the total absence of dan-
gerous effects, even when this has been taken for a long time consecutively.—
London Med. Record, Feb. 15, 1879.

First Insensibility from the Inhalation of Ether.

At a late meeting of the Therapeutical Society of New York (*New York Med
Journal*, March, 1879), Dr. R. F. WEIR, Chairman of the Committee on Surgi-
cal Procedures and Appliances, presented a report on the first insensibility from
ether, as described by Dr. John H. Packard in the *American Journal of the
Medical Sciences* for July, 1877.

Dr. Weir stated that a number of cases have been reported to the committee
confirmatory of the statements of Dr. Packard, but certain differences were ob-
served. No question as to the satisfactory degree of anæsthesia exists, but the
duration of it in several instances exceeded the time allotted to it by Dr. Packard
—occasionally reaching to three minutes ; also, while all recollection of pain was
done away with, yet at times the patients would by movement, and sometimes by
cries, give evidence of sensation during the incision ; and, still further, it was
noticed by Dr. W. T. Bull and himself that, even when the insensibility was
marked, muscular relaxation was ofttimes insufficient to permit of a reduction of
a dislocation or a displaced fracture.

One case reported by Dr. Gibney shows that in chloroform inhalation the "first
insensibility" exists—a point upon which Dr. Packard, from want of experience,
was unable to speak. Dr. Weir adds that this "first insensibility," or, as it is
commonly called in New York, "primary anæsthesia," has now become fully
established in the practice of the New York and Roosevelt Hospitals.

Dichloride of Ethidene as an Anæsthetic.

The Scientific Grants Committee of the British Medical Association have received from a special committee a report (*British Med. Journal*, Jan. 4th and 25th, 1879) upon the action of this anæsthetic, in which it is claimed that dichloride of ethidene presents all the advantages of ether, without any of its disadvantages; and that the following opinion of Steffen, given in Binz's *Evidence of Therapeutics*, p. 39, is correct in most particulars: "It is said to have the following advantages over chloroform, which it resembles in its ultimate action, namely, a pleasanter smell, the power of producing narcosis more rapidly, as well as without excitement or vomiting, more rapid recovery without after-effects, and altogether less danger." In their experience, narcosis has not been produced more rapidly than with chloroform, but rapidity of narcosis depends very much on the mode of administration.

MEDICINE.

Intravenous Injection of Milk in Anæmia.

N. Wulfsberg has made a series of researches on animals on the effects of the intravenous injection of milk, recommended by Gaillard Thomas, as a means of preserving life in cases of hemorrhage and other forms of anæmia. He injected about 250 grammes, and examined the blood, especially with a view to determine whether, as Donné stated in 1844, the globules of milk were converted into white corpuscles. He found that the white corpuscles undoubtedly increase in number, but only after having first taken up—in fact, eaten—the milk spheres. He was unable to preserve the life of dogs by this means; their body weight diminished, and they died without obvious disease, and he found hemorrhagic infarcts in the lungs. He found it to be impossible to maintain the life of animals by subcutaneous injections of fresh milk as they became atrophic. If about .75 per cent. of the estimated weight of blood were withdrawn from dogs, they bore the intravenous injection of milk well; but when large quantities were introduced they rapidly died. The injection of milk caused the sounds of the heart, which were previously inaudible, to become clear and distinct. He thinks, however, a milk injection can never supply the place of an injection of blood.—*Lancet*, Dec. 7, 1878.

On the Action of Salicylate of Soda in Acute Rheumatism.

M. Edmond Marrot presents (*Archives Gén.*, Feb. 1878) the following conclusions concerning the action of salicylate of soda in acute rheumatism, deduced from an examination of the blood and urine:—

1. During the course of acute articular rheumatism the quantity of urine notably diminishes, the proportion of uric acid increases, and this increase is not to be explained by the diminution of the quantity of urine; the increase is absolute.

2. In those cases in which acute articular rheumatism has been left to itself, the cure is shown by a marked increase, during several days, of the quantity of urine, and by the return of the proportion of uric acid and urea to its original figure.

3. The salicylate of soda, administered during the period of acute articular rheumatism, hastens, in some degree, this natural crisis. One or two days after being administered the urine becomes very abundant, clear, and of a low density. There is a relative polyuria; the quantity of urea and of uric acid diminishes in

very large proportions. An interesting thing to observe, is that these modifications of the urinary liquid are produced independently of all question of temperature.

4. In cases of chronic articular rheumatism the quantity of uric acid and of urea is rather diminished. Here the use of salicylate of soda has no useful result. When a sufferer from chronic rheumatism is placed in baths of a high temperature the amount of uric acid contained in the urine is noticeably increased. Thus, as Professor Lasègue has demonstrated, baths of a high temperature are of great service in chronic rheumatism.

5. The salicylate of soda, like baths of a high temperature, does not increase specially the anæmia in acute articular or in chronic articular rheumatism.

6. During the course of either acute articular rheumatism or of chronic articular rheumatism the quantity of phosphoric acid is diminished, and so remains, whatever may be the treatment employed.

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Rheumatism of the Diaphragm.

Dr. MADER, in the yearly report of the Rudolf Institution in Vienna (*Allgemeine Wiener Medizin. Zeitung*, November 5) remarks that the diagnosis of a rheumatic or neuralgic affection of the diaphragm is evidently more a matter of inference than of certain evidence. Yet from time to time cases come under observation, which scarcely admit any other explanation. In the present instance, the patient was a powerful muscular butcher, twenty-seven years of age, who was attacked one morning with very severe pain, extending from the scrobiculus cordis to the back, and greatly impeding respiration. The breathing was quick, short, and superficial; purely thoracic. Movements of the abdominal walls, indicating contraction of the diaphragm, were almost entirely absent. There was much turgor of the face, but no marked febrile symptoms. Nothing abnormal was found on examining the chest. A subcutaneous injection of morphia in the epigastrium was followed by a cessation of pain and by sleep. Next morning the patient was free from all difficulty of breathing, but he complained of pain in the right scapular region. This also was relieved by injection of morphia, and the patient was discharged cured on the third day.—*London Med. Record*, Dec. 15, 1878.

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Syphilitic Epilepsy.

Dr. T. S. DOWSE, in the *Practitioner* for October, 1878, gives a summary of his observations upon two hundred and seventy-four cases of epileptiform seizures of an undoubted syphilitic origin. As the result of acquired syphilis Dr. Dowse believes epilepsy to be extremely rare, but, in its hereditary form, producing, as it appears to do, an unstable and defective evolution of the nervous centres, to a degree far beyond any other agency; primary idiopathic epilepsies are more due to hereditary syphilis than to any other causes. Acquired syphilis does not predispose a stable brain and nervous system to attacks of epilepsy, *petit mal*, or epileptoid seizures, unless under two conditions—namely, first from absolute organic change in the nervous substance (vessels included), and, secondly, where albuminoid syphilis has so impaired the vaso-motor centres and vascular functions of repletion, exchange, and repair, that blood becomes not only attenuated but loaded with effete products. Acquired syphilis has, in some cases, actually relieved unstable brains during the secondary stages, and for some years subsequently from the epileptogenous tendency, which, however, has returned with tenfold violence in later years. In other cases, a patient suffering from acquired syphilis sustains an injury to the head and becomes epileptic, whereas, had he not been syphilized, this would not have occurred. Dr. Dowse has met with

several similar cases, in which, moreover, the epileptic habit has become confirmed, and been transmitted to the offspring. In diagnosing syphilitic epilepsy we must first consider the two classes of epileptics—the one where the mind between the seizures is unaffected, as in such cases as Cæsar, Napoleon, and many others, and where there is more or less mental derangement between the attacks. It is to the latter class of cases that syphilitic epilepsies essentially belong. Should a man or woman be attacked with epilepsy between thirty and forty years of age, without any hereditary predisposition or a previous seizure, then a syphilitic origin may be suspected. If between the attacks there be more or less mental derangement, the diagnosis is simplified, and still more so if there be a paresis more or less profound, localized or unilateral, but gradually passing off after the epileptiform seizure. The reflex processes are rarely, if ever, completely absent. The iris may contract under the influence of a strong light; the lids close when the conjunctiva is tickled, and a state of subconsciousness rather than of profound coma is a prominent feature from first to last. The stages of the attack are all ill-defined and merge the one into the other. Rarely is there the general tonic spasm with thotonism. Pallor rather than cyanosis is the facial exponent, and the fit is prolonged often many hours, with intervals of wandering, delirium, and excitement. Foaming at the mouth is less common than a profuse flow of saliva, and all sorts of cries are associated with the seizure ; but rarely, as Romberg expresses it, '' Shrill and terrifying to man and beast.''

As to albumen in the urine, it is present in but few cases ; but epileptoid seizures, associated with albuminoid syphilis and a plentiful secretion of phosphatic albuminous urine, are not uncommon.

[Several valuable contributions have been made to this subject during the last few years in the pages of the various medical journals, references to which, up to the end of 1876, may be obtained by turning to the *Medical Digest*, section 1307 : 5 ; since then, Dr. Dreschfeld, *Lancet*, February, 1877, p. 269 ; an able editorial review on Jacksonian epilepsy, *Lancet*, August, 1877, p. 171 ; and Dr. Ferrier, *Medical Times and Gazette*, April, 1878, p. 456, have added to the literature of the subject.] — *Lond. Med. Record*, Dec. 15, 1878.

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A New Symptom of Irritation of the Facial Nerve.

Dr. LEUBE describes (*Aerzt Intellig.-Blatt*, No. 53) the case of a woman, aged sixty-two, who had been suffering from spasmodic tic douloureux for two or three months. It began with conjunctivitis, which was followed by blepharospasm ; the spasm then spread over other branches of the facial nerve. The platysma myoid was the first muscle affected by the spasm, then followed the other muscles of the face. The spasms were so violent that the patient declared she felt as if her whole lower jaw were being torn away. At first, there was profuse salivation, but this gradually decreased. The spasms were clonic bilateral, and extended to all the muscles supplied by the facial nerves, specially to the orbicularis palpebrarum and the platysma myoides. The paroxysms followed in quick succession, but sometimes ceased altogether for several hours. When the paroxysm reached its climax, the patient sometimes uttered a peculiar sibilant sound, which could be produced by drawing the soft palate upwards, at the same time contracting the uvula and performing expiration. It was, therefore, at once suspected that, even while the spasm lasted, the muscles of the palate were convulsively contracted. This supposition was verified by subsequent laryngoscopic examination during the spasm. If the tongue were slightly depressed, it was easily seen that, when the paroxysm was very violent, the palate, which until then had been apparently in a rather relaxed condition, suddenly was contracted

and drawn upwards, and the uvula, contracting also, almost disappeared. Dr. Leube, therefore, supposes that the sibilant sound, as well as the spasmodic contraction of the palate, were due to the part which those branches of the facial nerve that supply the palate took in the spasm. It was not possible to prove whether those fibres of the facial nerve which stimulate the secretion of the saliva were also excited. The treatment consisted in giving Fowler's arsenical solution, either.internally or hypodermically, and the results were most gratifying.— *British Med. Journal*, Feb. 1, 1879.

Lead-Palsy cured by Magnetic Contact.

M. Debove communicated, at the meeting of Jan. 24th of the Société Médicale in Paris, the following case, which has a special interest in relation to M. Charcot's recent studies of the influence of magnets on human diseases. It is reported as a case of old hemiplegia, brought on by lead-poisoning, cured by a single application of magnets, in a patient who was not hysterical. The patient, aged 26, a painter by profession, was received into the Hôtel Dieu in August, 1878, suffering from symptoms of lead-poisoning, such as convulsions, coma, etc. These symptoms disappeared in a few days, but the patient retained a complete left hemiplegia. There is no doubt now that saturnine hemiplegia really exists, five or six cases having come under observation, the first of which have been observed and described by M. Vulpian. M. Debove was, therefore, fully justified in considering the present case as a similar one. From August till January, the patient remained in the same state, without improving much. Both the mobility and sensibility of the whole left side were affected; if pricked with pins, the patient only felt the pricks on the inner surface of the arm. The left side of the tongue was affected in a similar manner; the sensation of taste was lost on the left side of the tongue; the left side of the pharynx could be tickled without provoking any reflex movement; the patient could not smell with the left nostril; his hearing was affected in the left ear; the left cornea was insensible; the visual perception had also greatly decreased; the retina was partly insensible. There were also scotomata of the left eye. M. Debove resolved, then, to try the experiment of applying a magnet to his patient. He accordingly took him to the Salpêtrière, where all the necessary apparatus are to be found. The patient's left hand was placed between the two poles of Faraday's electro-magnet, and, in a very short time, not only general sensibility, but also the particular sensibility of some of the organs of sense, was restored. During the following fortnight, the patient progressed favourably, and has now almost entirely recovered both sight and smell. The sense of taste alone has not yet been quite restored, and the sole of the left foot has remained insensible. This case will give rise to many objections. But M. Debove, foreseeing the latter, was fully prepared to refute them. The patient, when taken to the Salpêtrière, could not know what would happen to him there, or in what way he would be treated; a counter-experiment was then tried, and there is no reason whatever to accuse him of simulation. The patient, who never had any attacks except the one mentioned, could not be placed on a level with hysterical women who were accustomed to practise simulation. M. Debove also reminded the assembled members of the Society, that M. Proust, of the Lariboisière Hospital, treated a similar case in the same way, obtaining the same results, only with the exception that the amelioration did not last beyond twenty-four hours; at the end of which time the patient had relapsed into his old condition of hemianæsthesia, on the same side as before. The difference between both cases is very tangible; in one case the sensibility is lastingly restored, and in the other only temporarily. It is to be noticed that neither of the patients presented the phenomenon which generally occurs in hysteria, viz., the transfer

of the anæsthesia from the affected part to the opposite one, after the application of the magnet.—*British Med. Journal*, Feb. 22, 1879.

Laryngeal Consumption.

In a very excellent and most industrious monograph (Leipzig, Veit & Co., 1879), intended to contribute to the solution of the question, whether *tuberculosis* of the mucous membrane of the larynx and trachea is identical with *consumption* of these parts, or whether the latter disease is but a consequence and further development of catarrhal and inflammatory processes within the air-passages, HEINZE has collected very careful statistics, and reported very accurate microscopical examinations of a large number of specimens of this disease, his observations being based upon not less than 475 cases, which were dissected in the P. M. room of the University of Leipzig within a period of nine years. He begins by contrasting the views of *all* authorities on the question, who differ wonderfully in their opinions from each other, and then passes over to his own observations. Space unfortunately does not allow us to quote more than a few of the important results he has obtained, but we take this opportunity to recommend strongly the perusal of the pamphlet to all readers interested in the question. Amongst the most important conclusions, in a statistical point of view, are the following : Ulcerations within the larynx were observed in 30.6 per cent., within the trachea in 8.0 per cent. of all the cases of phthisis observed. Men are more frequently attacked than women. Ulcerations within the larynx are *very* rare in other diseases than in phthisis (syphilis, diphtheria, croup excepted). The organs more frequently affected besides the lungs in pulmonary phthisis are the intestines (51.3 per cent.), after that the larynx (30.6 per cent.). Ulcerations of larynx and trachea in pulmonary phthisis are more frequently met with in patients between 21 and 30 years of age. They are extremely rare in childhood. There is no certain predisposition to *laryngeal* phthisis in consequence of the patient's occupations ; but as a rule, those classes fall ill most frequently with laryngeal affection who are also mostly predisposed for *pulmonary* phthisis. The next part is devoted to the Pathology of the disease : *In 94 per cent. of all the cases examined, there were either tubercular processes in larynx and trachea simultaneously, or in either of them alone ; in 60 only the tubercular origin of the ulcer could not be demonstrated.* Tubercular *infiltration* was met with in 52.5 per cent. of all cases examined (most frequently on the ventricular bands and ary-epiglottic folds, further—in descendent line—on the mucous membrane of the arytenoid cartilages, vocal cords, epiglottis). Tubercular *ulcers* were found most frequently on the vocal cords (in 81 per cent.) ; further—in descending line—on the epiglottis (in 53 per cent.) ; in the trachea (also in 53 per cent.) ; on the arytenoid cartilages (in 46.9 per cent.) ; on the ventricular bands (in 28.5 per cent.) ; in Morgagni's ventricles, and on the inner surface of the cricoid cartilage (in 24 per cent. together). There is no connection between these ulcers and cavities in the lungs. Next, the microscopical changes, into the description of which we cannot enter here, are considered (the illustrations which accompany the description are very instructive) ; and finally, Heinze comes to the conclusion, that although there *may* be found *non*-tubercular ulcers in cases of pulmonary phthisis, their existence is quite accidental and unimportant, whilst the *large destructions of the larynx, which hitherto have been called with the common name of "laryngeal consumption," are exclusively due to tuberculosis of the mucous membrane of the larynx.* In the last chapter, which treats of the Pathogenesis and Etiology of the disease, the author comes to the following conclusions : 1. A *primary* tuberculosis of the larynx most probably does not exist. 2. It is *not* possible to conclude from the laryngoscopic appearance of an ulcer *alone*, whether its nature is tubercular or

not. 3. A *cure* of the laryngeal tuberculosis will most probably never be obtained. With regard to No. 2, he says, however, that (*a*) the situation of the ulcers on the epiglottis, ventricular bands, in the ventricles, etc., (*b*) the *simultaneous* existence of ulcers on *several* of these places, (*c*) the *intensity, depth, and extension* of the ulceration, (*d*) its *duration* and *incurability*, will often permit us to diagnose *with a great deal of probability*, the tubercular nature of the process, without having recourse to examination of the lungs, etc.—*London Med. Record*, Jan. 15, 1879.

Syphilitic Affections of the Larynx.

In the first part of a contribution to the study of respiratory troubles in syphilitic disease of the larynx (*Annales des Maladies de l'Oreille, du Larynx, et des Organes connexes*, September, 1878), M. KRISHABER begins by alluding to the period of the disease at which laryngeal affections appear, and is of opinion that it is impossible to assign a limit to the time at which they may develop. According to an analysis of cases made by himself and Mauriac at the Hôpital Midi, the earlier syphilitic eruptions of the larynx appeared from two to six months after the primary sore; only once was the interval so great as ten months. The later affections are frequently met with after an interval of perfect health, long after infection, generally about four or five years, but also ten or fifteen, and even much later than this. Sometimes, many years after infection a simple erythema occurs, whose specific character is only revealed by the subsequent appearance of grave symptoms. What seems to be a simple laryngeal catarrh, some time after contamination, may give rise to œdema endangering life; and it is most important to remember that œdema may complicate all forms of syphilitic laryngeal disease, whether recent or of older date. Any laryngeal trouble in a syphilitic subject, though only seeming due to a cold, should be treated as of grave import.

Syphilitic vegetations form most frequently without œdema. They grow very slowly, and attack, in order of frequency, the true vocal cords, the false vocal cords, the subglottic mucous membrane, and lastly, any other part of the laryngo-tracheal cavity. The lesions consist of a kind of membranous prolapse at the level of the vocal cords, arising sometimes from one or other surface, and forming a sort of diaphragm which tends finally to bring about complete obstruction. Sometimes true polypoid vegetations occur. It is easy to distinguish syphilitic from simple polypi, as the latter form in a healthy organ, whereas the former are only consecutive to previous lesions, generally ulcerative. There is no clear local sign of distinction between syphilitic and cancerous or tuberculous growths; the diagnosis must be made from other facts connected with the case.

Another form of syphilitic narrowing is caused by the cicatricial contraction of the tissues after loss of substance from deep and extensive ulceration; but when the mucous membrane only is affected, it recovers wonderfully under specific treatment, and it is sometimes scarcely possible to find any trace of the lesion afterwards. Although the acute stenoses are promptly influenced by treatment, the author has never seen the chronic form regress under any kind of medication.

The chronic stenoses are divided into three classes, as follows:—

1. Where the glottis is obliterated, and respiration is carried on through the tracheal canula; voice abolished.

2. *Inspiratory stenosis.*—Patients are unable to inspire sufficient air, but can expire enough to cause sonorous vibrations of the vocal cords, if these be not too much implicated; hence there is some degree of voice. Such patients also require tracheotomy.

3. *Incomplete laryngo-stenosis.*—Tracheotomy has been avoided. The lesion is arrested, but no improvement occurs. The patients breathe sufficiently to live,

if kept quiet, and no complication arise. They may enjoy fair health. The voice is more or less normal.

In these cases wheezing or whistling breathing (*bruit de cornage*) is not in direct relation to the intensity of the lesion.

The *prognosis* of syphilitic laryngo-stenoses is arrived at especially by noticing the evolution of respiratory symptoms. If these come on slowly, they constantly indicate insidious organic disease leading to a serious result. If, on the contrary, disorders of respiration occur rapidly, they indicate a state of imminent danger ; but one capable of being promptly relieved by energetic treatment. Syphilitic lesions are generally more grave in the trachea than in the larynx, and laryngeal lesions are of more serious import in the subglottic portion than when situated above the vocal cords. Œdema appears to happen most frequently after a chill. Krishaber thinks it well to consider most cases of œdema in non-tuberculous persons as being syphilitic, whether cold be or be not assigned as the cause ; and calls attention to the fact that œdema of the larynx is rare apart from any diathesis, while in diathetic affections it is the reverse. Therefore, bearing in mind the possibility of relieving syphilitic œdema by general treatment, and without any operation, it is rational to admit the presumption of syphilis, and to act accordingly, although the diagnosis be uncertain.

The *treatment* recommended to prevent relapse, which is always so likely to occur, is as follows : Once the cure obtained, the patient is to be left without treatment for an entire month. Afterwards, during the first eight days of each month, a teaspoonful of Van Swieten's solution (solution of perchloride of mercury), and during the last eight days of each month a gramme (15 grains) of iodide of potassium. This treatment is to be continued for about a year, for it has been abundantly proved that a patient who has had laryngeal symptoms, however slight, is liable to relapse under the most severe form, after premature cessation of treatment. The author concludes this part of his paper by giving reports of five cases, showing how tracheotomy may be avoided in some of the most urgent cases of laryngeal syphilis, provided the affection be recognized, and active general treatment promptly carried out.

Case I. was one of acute laryngo-stenosis, without œdema (which is rare), due to a syphilitic tumour of the thyroid cartilage causing displacement of the whole larynx. The tumour disappeared under active treatment, and without tracheotomy, although the patient was almost asphyxiated when first seen.

Case II. was that of a patient, aged 45, with multiple erosions and œdema of the larynx. The patient, though improving under treatment, neglected to attend. When next seen, the difficulty of breathing was so great that tracheotomy was proposed. The patient, however, refused to submit to the operation, and quite recovered under the active administration of mercury and iodide of potassium.

Cases III. and IV. also illustrate the good effects of active treatment ; both· were extremely severe, one having been sent for immediate tracheotomy.

Case V. was that of a patient aged 42, sent to M. Krishaber for tracheotomy on account of extreme difficulty of breathing. The laryngoscope showed inflammatory œdematous swelling of the epiglottis, and false vocal cords, and œdema below the glottis. Under active mixed treatment, respiration became normal in fourteen days. Nitrate of silver was also applied locally, but did not seem to have any good effect.—*London Med. Record*, Dec. 15, 1878.

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The Treatment of Diphtheria.

Professor Klebs, of Prague, describes in the *Med.-Chir. Centralblatt*, No. 22, a series of experiments performed on himself and other persons to test the efficacy of benzoate of soda in destroying the formation of microscopic fungi in

the body. He has found that it procured relief in several cases of gastric catarrh, and other diseases, which are often noticed in persons who work a great deal among decomposed organic substances. In order, however, to be quite certain of the antiseptic or antimycetic power of this drug, it was necessary to find out whether, when introduced into the body of a healthy animal, it would enable it to resist infection. Diphtheritic membranes were accordingly soaked for some time in Buchholz's solution; then mixed with benzoate of soda, and inoculated upon the surface of several healthy animals, of which some had previously received a hypodermic injection of the above mentioned substance. It was then shown that, in those animals which had had the injection, the diphtheritic membrane was destroyed in ten minutes, whilst it still could be seen in the eyes of the others two hours after the operation. Klebs has administered benzoate of soda in doses varying from five grammes to his patients, who never experienced the least inconvenience from it.—*British Med. Journal*, Dec. 21, 1878.

Use of Chloral in Diphtheria.

Dr. ROKITANSKY (*Medicinisch-Chirurgische Randschau*, Nov., 1878) has used a 50 per cent. solution of chloral in three cases of diphtheria which had resisted the usual remedies, such as salicylic acid, carbolic acid, etc., and every time with the same results. The solution was applied every half hour with a camel's hair brush, and caused very little pain, except in one case where the tongue was thickly covered with a layer of diphtheritic matter; here a very considerable secretion of saliva was always observed immediately after the application, and the pain ceased entirely after a few moments. In the other two patients, in whom both tonsils were partly covered with the diphtheritic membrane, the pain was insignificant.

After the solution had been applied three times, *i. e.*, one hour and a half after the first application, large pieces of the membrane could be easily removed with the brush. The underlying portion of the mucous membrane was red and covered with fine granulations. As soon as the normal tissue could be seen, weaker solutions of chloral were gradually used during a week, at the end of which the patients had entirely recovered.—*London Med. Record*, Dec. 15, 1878.

Pleuritic Effusion in which the Left Thorax was drained by a fine Canula and Capillary Tube.

At a late meeting of the Clinical Society of London (*Med. Times and Gazette*, Feb. 1, 1879) Dr. SOUTHEY read the notes of the case of a carman, aged 23, of average build, height, and weight, who was admitted into St. Bartholomew's Hospital with the ordinary symptoms of pleurisy with effusion upon the left side, of about nine days' duration. He kept to his work until the day before admission to the hospital, and walked up stairs to his ward. On admission his temperature was 102.2°, respiration 24, pulse 80; cough was slight, and the usual symptoms of feverishness. There was absolute dulness of the left lung in front and laterally, and posteriorly as high as the root of the lung, general absence of respiratory sounds on the left side, and increased breathing of the right lung. The patient was ordered an effervescing draught of tartrate of soda with ten grains of nitrate of potash and ten minims of tincture of digitalis every four hours; and a draught containing one-sixth of a grain of morphia at bedtime, if required for sleeplessness or pain. On the second day after admission the feverish symptoms were scarcely changed, the nights were restless, there was frequent cough, and the urine scarcely averaged twenty ounces per diem. The dulness over the left lung extended higher up posteriorly. On the following day one of Dr. Southey's

first canulæ was introduced into the left pleural cavity in the fifth intercostal space in the mid-axillary perpendicular. Clear serous fluid escaped, and was conducted by a capillary drainage-tube to a jar beneath the bed. The man fainted directly the tube was introduced. It remained *in situ* for twenty-eight hours, hurting a little, and was then removed. Four pints of pleuritic fluid, specific gravity 1020, were drained away. The left side was then less dull on percussion; a loud friction rub was audible in front and behind, and bronchial breathing in front, at the side, and behind. There were thus abundant signs of lung-expansion. On the night after the operation the lad had a morphia draught, and slept well, and in the first twenty-four hours passed two pints and a half of urine of specific gravity 1019. The next day the same quantity passed, and on the following day as much as five pints and three-quarters, of specific gravity 1022. The daily quantity of urine during the next ten days varied from forty-five to seventy-five ounces. The saline mixture with digitalis was continued, and full diet with four ounces of wine was given. The temperature gradually fell until it reached the normal range on the fourteenth day after the operation, when the respiratory sounds of the affected lung were all still improving. He left the hospital on the thirty-second day after operation; the left shoulder was then slightly dropped. The percussion-note was good at apex, front, as low as the fifth rib, the axilla, and to the angle of the scapula behind; there was dulness over a hand's breadth at the base of the lung laterally and behind. A rough leathery friction sound was audible in the left suprascapular, intrascapular, axillary, lateral, and infra-mammary regions. The cardiac sounds were normal. Dr. Southey remarked that not a tinge of blood came at any time through the canula; that the side had not been emptied, but simply relieved; and that the renal secretion immediately more than doubled. He had now tapped the chest five times in this manner, once drawing off nearly twenty ounces of purulent fluid, without any complication or accident, and he commended the proceeding for adoption in the hydrothorax of scarlatinal dropsy, as well as in any pleuritic effusion when the temperature remained high and the urine became progressively scantier day by day. Dr. Southey exhibited the last and best form of his fine drainage trocar and canula, suitable for paracentesis abdominis or thoracis, or the draining of anasarcous legs. The trocar would adapt itself to different lengths of canula by means of a crochet-needle screw holder. The instrument would hold two sets or sizes of trocars and canulæ. A fixed shield was adapted to it, and held the canula *in situ* when it was used through the abdominal or thoracic walls. Dr. Southey had used the instrument in twenty or thirty cases of paracentesis abdominis without any untoward result. Messrs. Ferguson's foreman had gradually improved the instrument for Dr. Southey's trials, and it now seemed quite satisfactory.

In answer to a number of inquiries that were made, Mr. Southey said that adults fainted after the operation much more frequently than did children. The canula in his case was only running for twenty-four hours. An ordinary aspirator would draw off the fluid more rapidly, but was very apt to end by drawing off blood, which might or might not be prejudicial to the patient. His operation was a little longer, but more safe. Only a portion of the fluid, enough to relieve the pressure, was usually removed, and the remainder was left to nature. He had often heard the friction-sound produced after the withdrawal of a larger canula. Usually, however, it was only audible in front: but in this case it was heard in three situations, showing that the expansion of the lung had taken place in all three directions. The saline draught of nitrate of potash and digitalis had been continued from the first whilst the patient remained in hospital. The pulse fell from 100 to 60 and 50 beats in the minute, and the urine at the same time increased. He had often noticed the contemporaneity of the two events. He

should not employ that method of treatment if he knew that the fluid in the chest were purulent, though in one case, where the fluid turned out to be pus, he had drawn off a pint of it in six hours. As to the vocal sounds, there were vocal vibrations heard over the upper part of the lung, and ægophony was audible before and after the operation. No vocal vibrations were heard at the base of the lung; but there was dulness at the base even when the patient left the hospital. He had remained at work since then until now, with a small fistulous opening in the side, which still discharged a small quantity of fluid. He felt occasionally a little troubled; then a kind of boil would appear at the fistulous opening; this would open and discharge a little clear fluid, and the patient again became better. Usually there was not much chance of a fistulous opening resulting from this operation.

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The Detection of Pyloric Insufficiency.

A method of diagnosing alterations in the structure of the pyloric orifice of the stomach, which render it incapable of complete closure, is described by Professor Ebstein, of Göttingen, in No. 155 of Volkmann's *Sammlung Klinischer Vorträge*.[1] The method is not new in principle but new in its diagnostic application, and it consists in artificially distending the stomach with carbonic acid gas. If the pylorus is able to contract naturally, this gas simply renders the contours of the stomach clearly visible through the abdominal wall, while on percussion a markedly tympanitic note is produced over the whole area of the stomach, which clearly defines it from the neighbouring intestinal tract. Supposing, however, the pylorus is incapable of complete closure, almost immediately after the stomach becomes dilated, the gas makes its way into the duodenum and thence into the bowel, giving rise to acute tympanites. The latter varies in degree in various sections of the intestine, while the distension of the gastric walls remains but slight, so that it is not always possible to mark out the stomach, either by inspection or percussion. Gaseous distension has been used by Dr. S. Fenwick in England, and by Frerichs and Heinrich Wagner in Germany, with the view of determining the boundaries of the stomach, but Professor Ebstein appears to be the first who has utilized it for the purpose above mentioned. Opinions have been rather divided as to the normal condition of pyloric contraction during digestion, and Professor Ebstein has himself undertaken some interesting experiments on animals, with a view to acquire some accurate knowledge on the subject. Four dogs and a cat were experimented on, and all the animals were narcotized and killed at the end of the experiment by the injection of chloroform into the trachea. The plan adopted was as follows: In three cases a solution of tartaric acid and then one of bicarbonate of soda was introduced into the stomach, and the upper end of the catheter was closed by a clamp. In the two others pure carbonic acid was forced into the stomach by the pressure of a short column of water. In all the cases one arm of a bent glass tube was tied into the commencement of the small intestine, and the other carried to the bottom of a vessel containing baryta water. In no case did the least cloudiness occur in this reagent so as to indicate the passage of any trace of gas through the pylorus. Care was also taken to make certain that there was no abrupt bend in the intestine to confine the gas, and that the duodenal catheter was quite permeable. The contraction of the pyloric muscles continued even until after death. In one case an incision through the longitudinal and circular fibres of the pylorus was made while the animal still lived, and it was not till the innermost circular fibres were divided that the stomach collapsed and the gas escaped. Professor Ebstein refrains from drawing too strict a con-

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[1] "Ueber die Nichtschlussfähigkeit des Pylorus (*Incontinentia Pylori*)."

clusion as to the contraction of the pylorus in man from these experiments on the lower animals, but such clinical observations as he has as yet collected are all in favour of the view that a healthy human pylorus is able to prevent all escape of gas into the duodenum. In examining a patient by this method a teaspoonful of tartaric acid is given in a little lukewarm water, and this is immediately followed by a large teaspoonful of bicarbonate of soda similarly dissolved. In two cases of cancer of the stomach (and it is mainly with this affection that the symptom of pyloric insufficiency is combined), the diagnosis made *intra vitam* by this method was completely confirmed. In one case the cancerous mass gave rise to a semicircular chink large enough to allow the forefinger to pass through it; and in the other a large ulcer, which extended deep into the left lobe of the liver, had destroyed as much of the pyloric ring as would admit two fingers. In five out of six other cases of pyloric insufficiency, without necropsy, the other clinical signs enabled an almost certain diagnosis of cancer of the stomach to be made. In the sixth case there were strong grounds for a similar diagnosis, as neither ulcer of the stomach nor any other organic changes, which in the absence of cancer would explain the great emaciation, vomiting, and severe dyspeptic symptoms, could be detected. Professor Ebstein, however, distinctly admits that the existence of incomplete closure of the pylorus is not necessarily connected with cancerous changes, or that we are as yet able to draw from this symptom an accurate conclusion as to the form of disease. A simple ulcer may impair the function of the pyloric muscles, and very probably pyloric insufficiency may, in some cases, have a nervous origin; for example, in hysteria, where the tympanites of the intestine can be explained by the immediate passage of the air which such patients swallow, from the stomach into the bowel. The majority of cases will, however, probably be cancerous; and further, if in a given instance the diagnosis of cancer of the stomach can be definitely made, and the carbonic acid test reveals pyloric insufficiency, Professor Ebstein believes (and probably no greater authority on cancer of the stomach exists) that even if vomiting is absent the seat of the disease may, with great probability, be assigned to the pylorus. In conclusion, he points out that this method, assisted by careful post-mortem examination of the pyloric region, may help to clear up some of the obscurer symptoms of diseases of the stomach. It may be used without fear either of distressing the patient or of enlightening him as to the character of his malady.

Thus says Professor Ebstein: but we have some hesitation in accepting this dictum. The intense and overpowering distress sometimes occasioned by over-distension of the stomach with air or gas of any kind is unfortunately too well known to many. Not only are the movements of the diaphragm and that of respiration interfered with, but the movements of the heart, both directly and through the cœliac plexus, are also impeded. Such a degree of oppression is thus produced, that it is not an uncommon factor in the immediate cause of death in certain forms of disease.—*Med. Times and Gaz.*, Feb. 1, 1879.

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Citrate of Caffein as a Diuretic in Cardiac Dropsy.

Prof. Gubler has drawn attention to the special property of citrate of caffein of inducing abundant and instantaneous diuresis in cases of cardiac dropsy. Dr. LEWIS SHAFLER (*Practitioner*, Jan. 1879) has confirmed this observation, and finds that the caffein, in doses of from gr. iij to gr. vj, is a diuretic and cardiac stimulant of great value in such cases of cardiac dropsy where a dilated, feeble, and irregularly contracting heart undergoing progressive mural decay is the main clinical and pathological element to be contended against.

Periodic Hæmoglobinuria.

Among the diseased conditions which the improved methods of observation have brought to light of late years, perhaps none is better characterized than that which was first described in England by Dr. Pavy as "paroxysmal hæmaturia," and which has also more recently been called "intermittent hæmatinuria," and in Germany "periodic hæmaglobinuria." The number of cases recorded is not large; most of them are English, six German, and only two French; but there is a striking resemblance between all of them. After exposure to cold the patient shivers, suffers from peculiar sensations in the loins and extremities, becomes febrile, and passes dark-coloured urine, highly albuminous, often containing hyaline casts but no blood-corpuscles, although oxyhæmoglobin can be detected by spectrum analysis. At the same time the skin becomes sallow, the conjunctivæ perhaps icteric, and the patient feels weak and depressed. Tenderness in the renal region is a common system, but the functions of all the other organs of the body may be normal. The temperature at the onset of an attack may reach 40° Cent. (104° Fahr.), or in the milder paroxysms may be little raised. We do not intend here to occupy more space with the details of individual cases, which can be found in Dr. Legg's paper (*St. Bartholomew's Hospital Reports*, vol. x.), in Professor Lichtheim's recent lecture (*Volkmann's Sammlung*, No. 134), or in the paper of Drs. Kobert and Kuessner (*Berliner Klinische Wochenschrift*, No. 43, 1878). A far more interesting subject of discussion is the source of the hæmatinuria. Is it due to a renal congestion, to an alteration of extravasated blood by oxalates in the bladder itself (Van Rossem), or to dissolution of the red corpuscles within the circulation at large? Let us consider the third hypothesis first, and, calling to mind the numerous experiments which have been made of late years on the transfusion of the blood of one animal into the circulation of another (see, for example, *Medical Times and Gazette*, vol. ii. 1874, pages 263, 689), let us compare the symptoms observed in these experiments with those met with in periodic hæmaglobinuria. They are very nearly identical. There is common to both the shiver, the transient fever, the lumbar uneasiness and pain, and the hæmatinuria, and the parallel has been rendered still closer by the occurrence of urticaria, a tolerably common sequela of "heterogeneous" transfusion, in a patient of Dr. Lichtheim's (*loc. cit.*, page 2) with periodic hæmaglobinuria.

Now, it has been proved by Landois and Ponfick that the red blood-corpuscles of one animal transfused into the circulation of an animal of another species undergo a gradual process of disintegration and solution, in which the colouring matter of the blood passes into the serum, and thence through the walls of the renal vessels into the urine. Hence we are justified in assuming that in hæmoglobinuria proper, a solution of the corpuscles of the patient's own blood takes place. Can we, however, go further, and explain the alteration in the quality of the serum on which the disintegration of the corpuscles depends? It is certainly known that chemico-physical changes—extreme dilution of the serum by water and by glycerine, the injection of saponified bile acids, the inhalation of certain poisonous gases, severe febrile diseases, and lastly, extensive burns of the skin— are attended, with more or less constancy, by hæmoglobinuria, the origin of which in solution of the red blood-corpuscles has been proved in the case of burns by Max Schultze, Wertheim, and Ponfick.

Further than this we cannot at present go. We can only conjecture that as the disease before us is invariably excited by exposure to cold, some poisonous excretion from the surface of the skin is prevented escaping by the sudden contraction of the cutaneous vessels, and thrown back into the circulation. It is not

experimentally found that even severe cooling of the skin (in rabbits) produces hæmatinuria ; so that cold *per se* may be excluded as the cause of corpuscular solution.   The examination of the various organs of the body, especially those supposed to be mainly engaged in the formation of the blood—the liver and spleen—has as yet given negative results.   The kidneys are probably only secondarily involved, as the passage of hæmoglobin through them in large quantities has been found experimentally (Ponfick) to injure their secreting apparatus; and even if sufficiently prolonged, to cause death by the pathological changes it induces in them.   The icteric tint of conjunctiva so commonly noticed within the first few days of the attack is not dependent on bile pigment in the blood.   A form of hæmoglobinuria of rapid onset, and sometimes fatal, has been described by Professor Bottinger (*Deutsche Zeitschrift für Thiermedicin*, Bd. III., 1877) in horses.   The general symptoms, however, are different from those of human periodic hæmoglobinuria, and the reason for alluding to it here is the fact that sudden exposure to cold after several days' rest in a warm stable is invariably the exciting cause.   The chief post-mortem change is renal disease similar to that produced by experimental hæmoglobinuria.

The curious immunity of the female sex in man from this disease throws no light at present on the true causation.   It would, however, be interesting to know whether the same immunity prevails in horses.

After what has been written above, we need scarcely again refer to the hypothesis of renal congestion and vesical solution spoken of earlier in this article. Van Rossem's view, that oxalates cause disintegration of blood effused with the urine into the bladder, falls to the ground at once when it is found that oxalates are often absent in these cases, and that the presence even of a very few red blood-cells or their *débris* in the urine is extremely rare.

The prognosis of hæmatinuria is, according to Lichtheim, to whose excellent monograph we are largely indebted for the materials of this article, probably less favourable than English observers are inclined to regard it.   Though no fatal case has as yet been recorded, the chances of complete recovery seem to be very doubtful.   Lichtheim has watched a case for five years, and the attacks continue as they did at first.   But we are perhaps justified in assuming that repeated fits of hæmatinuria will cause a more and more extensive disorganization of the kidneys. The main element of rational treatment appears to be the avoidance of all causes of chill ; if possible, the removal to a mild and temperate climate; warmth and rest in bed during the paroxysm ; and the exhibition of iron in some one of its multitudinous forms when the pyrexia has subsided.—*Med. Times and Gazette*, Feb. 15, 1879.

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On the Use of Vaseline and Unguentum Vaselini Plumbicum in Skin Disease.

Prof. Kaposi (*Wiener Med. Wochenschrift*, No. 17, 1878), after stating that all emollient substances hitherto used in diseases of the skin, where the epidermis is removed or the surface is sensitive, as various fatty substances, oils, lard, glycerine, and glycerine of starch, are more or lesss irritating in most cases, refers to the bland and non-irritating properties of vaseline or petroleum jelly (with this also may be classed ozokerin and unguentum petrolei).   These have no tendency to become rancid, and are useful in softening and removing crusts and scales, as in cases of eczema squamosum when the surface is dry and desquamating.   He introduces an ointment which promises to prove of great value.   This is a modification of Hebra's well-known unguentum diachyli, which is seldom met with properly prepared except at Vienna.   This ointment, for which Kaposi proposes the name of unguentum vaselini plumbicum, is made by dissolving and incorporating thoroughly by aid of heat equal parts of lead plaster and vaseline, to which a

little oil of bergamot may be added to scent. It causes no burning sensation on excoriated parts, and is especially available in eczema. It is admitted by Kaposi that the original unguentum diachyli gave rise to unpleasant heat and even acute exacerbations of the eczema, due, he believes, to an evolution of fatty acids from the oil during boiling, and to an imperfect saponification of the oxide of lead.—*Edinburgh Med. Journ.*, Dec. 1878. [This preparation was originally recommended by Dr. H. G. Piffard, of New York (*Archives of Dermatology*, July, 1876), who had used it successfully in the treatment of eczema.—Ed.]

SURGERY.

Case of Extirpation of the Larynx.

Dr. Von Bruns relates (*Wiener Medizinische Presse*, November 17th, 1878) the case of a shoemaker, aged 54, who in 1873 began to suffer from pain in his windpipe; this gradually assumed a sharp burning character, and was accompanied by dysphagia, dyspnœa, paroxysms of coughing, and almost complete loss of voice. When he first came under notice, January 3d, 1878, the breathing was laboured and whistling, the voice could be hardly described as an intelligible whisper. Acute bronchial catarrh was present, and the man could take but little nourishment. An examination with the laryngoscope revealed the presence of an obstructing epithelial carcinoma, in a state of ulceration, filling the whole lumen of the larynx, with the exception of a small irregular opening, through which the air passed. The carcinomatous nature of the tumour was verified by the microscope. After some consideration it was decided that excision of the whole larynx afforded the patient the best chance of recovery, and, on the 29th of January, the operation was undertaken. Tracheotomy was not performed at the commencement, and the larynx was taken out from below upwards instead of from above downwards. As incision was made from the lower jaw to the sternum in the median line, and the deep dissection continued until the hyoid bone, the thyro-hyoid ligament, the thyroid cartilage, and the upper rings of the trachea, were laid bare. The perichondrium of the thyroid cartilage was raised as far as the cornua, and the neighbouring muscles reflected; the same steps were taken with regard to the cricoid cartilage, and so the entire larynx was fully exposed. The trachea was next opened at its upper rings, and Trendelenburg's tampon inserted. After this the larynx was pulled forward by means of hooks, and dissected out. There was no very great amount of bleeding. The operation occupied forty-five minutes. The patient was in a state of collapse when first placed in bed; this was followed by high fever lasting a week. On the 1st of February an ordinary tracheotomy tube was inserted into the windpipe. A fortnight after the operation this was replaced by a thick caoutchouc tube, the patient being able at this time to leave his bed with his general health much improved. In five weeks Gussenbauer's artificial larynx was tried, and with the aid of this instrument the man soon learnt to speak in an audible falsetto monotone.—*London Med. Record*, Jan. 15, 1879.

Excision of Thyroid Gland.

At a meeting of the Imperial Medical Society in Vienna, January 30, Dr. Wölffler showed a woman, aged 35, whose entire thyroid body had been removed by Professor Billroth for dyspnœa, caused by a tumour of the gland the size

of a large apple. The operation was performed according to the method recommended by Dr. P. H. Watson, the capsule of the gland being left intact, until the bloodvessels had been ligatured *in situ*. The bleeding was very slight. Antiseptic precautions were taken throughout, and on the ninth day the dressings were found to be unnecessary. The weight of the extirpated gland was 50 grammes. This is the twelfth patient from whom Professor Billroth has successfully removed the thyroid body, the size of the tumours varying from a hen's egg to that of a child's head. The average time taken for healing to be accomplished in these cases was seventeen days.—*London Medical Record*, Feb. 15, 1879.

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Case of Excision of the Spleen.

Dr. W. C. ARNISON records (*British Med. Journal*, Nov. 16, 1879) the following case of excision of the spleen :—

T. K., aged 37, was admitted on August 29, 1878, into the Newcastle-upon-Tyne Infirmary. He was a healthy man until last autumn, when he received a blow in the left side, below the ribs, since which he suffered pain, and his health failed. A few months ago, he noticed a hard tumour in the left side, which grew larger. His family history was good, and he had been a fairly sober man. He never had ague, nor had he been in ague districts.

The left side of the belly, from about an inch below the nipple to the crest of the ilium and to the median line in front, was entirely filled by the spleen; its surface was smooth, and it could be moved by pressure on its posterior border to the left of the spine. Ascitic fluid occupied the abdominal cavity, and was interposed between the spleen and the abdominal wall. The patient was of fair complexion, of waxy pallor, emaciated, and the microscope showed the presence of leucocythæmia. His appetite was fairly good. He had occasional diarrhœa. After consultation with his colleagues, it was decided to excise the spleen on the 29th of September.

Chloroform having been administered, an incision was made in the median line, extending about two inches on each side of the umbilicus. Dr. A. then passed his hand round the spleen, and found it free from adhesions; the incision was then enlarged, and the rectus muscle cut across, the artery being held and secured before the transverse incision was carried through the peritoneum. The diaphragmatic and capsular connections were carefully torn through, and the spleen then easily turned out; it was held up while the vessels, which were considerably enlarged, were tied with three whipcord ligatures; two large sponges were then held round the pedicle, which was divided, and the spleen removed. Much difficulty was now experienced in finding and securing one or two bleeding points, which seemed to be in the torn peritoneal connections, and were, of course, very deep. They were at last secured, the belly carefully sponged out, and the wound closed by interrupted sutures. The operation was conducted antiseptically, and occupied seventy minutes, the greater part of that time being spent in securing the bleeding points.

The patient was placed in bed with a pulse of 98, and of fair strength. On recovering from chloroform, he complained of severe abdominal pain, which was relieved by injecting one-fifth of a grain of morphia; but he never seemed to rally from the shock. About four hours after the operation, Mr. Dixon, Senior House-Surgeon, transfused by gravitation two ounces of milk freshly drawn, provision having been made for this in anticipation that it might be required. No more milk would flow into the vein. The pulse rose for a few minutes, but quickly fell, and death occurred five hours after the operation.

The symptoms pointed to shock rather than to bleeding as the cause of death; but the body was removed before this supposition could be verified by *post-mortem* examination.

The spleen weighed 7 lbs. 13 oz.   After its removal, ten ounces of blood drained out of it.

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Case in which a Testicle congenitally displaced into the Perineum was successfully transferred to the Scrotum.

Mr. Thomas Annandale, Professor of Clinical Surgery in the University of Edinburgh, reports (*British Med. Journal*, Jan. 4, 1879) the following case of this rare congenital affection of the testicle, in which, so far as we can ascertain, for the first time, the displaced testicle has been successfully transferred by operation and permanently retained in the scrotum.

On the 15th of June, 1877, Dr. Irvine of Pitlochry recommended to my care a male child, aged 3, who had been brought to him suffering from pain in the region of the perineum, which was much aggravated when the little patient was allowed to walk or run.   It was noticed that some abnormality existed in connection with the right testicle shortly after birth, but it was only when the child began to walk that the pain directed special attention to the part.   Dr. Irvine, finding that the cause of the pain was a displacement of the right testicle, asked me to admit the child into my wards, with the hope that something might be done to relieve the symptoms.

An examination of the patient showed that the right side of the scrotum was empty, but its skin and other tissues were well-developed.   On searching for the cord, it was felt to come out through the external abdominal ring in the usual way, but, instead of passing down into the scrotum, it could be traced to the perineum, where the right testicle lay.   This displaced testicle was felt to be well-developed, was of the usual size, and was lying under the skin and cellular tissue at a point a little to the right side of the middle line of the perineum.   It was situated at a little lower level than if it had occupied its usual place in the scrotum.   When pressure was made over the testicle, it caused much pain.   The left testicle was normal in situation and development.

On the 5th of July, I performed the following operation, with a view of transferring the displaced testicle to its proper position in the scrotum.   An incision, commencing over the external abdominal ring and extending half way down the scrotum, was made on the right side, so as to expose the cord, which was then seized, and by means of it the testicle was drawn out from its abnormal position. This was not done without the division of some adhesions, and there was one fibrous band attached to the bottom of the testicle above and to the tuberosity of the ischium below, which appeared to correspond to one process of the gubernaculum testis, and which required to be cut across before the testicle would leave the perineum.   The scrotum was now opened up more freely, and the drawn-out testicle was placed in it and securely fixed there by means of a catgut stitch passed through the bottom of the scrotum and lower part of the testicle.   The opening into the perineum along which the cord and testicle had passed was subcutaneously stitched with catgut, and a small counter-opening made at the most dependent point of the perineal cavity which had contained the testicle, so as to allow any fluid to drain away and insure the complete closure of the cavity and prevent the testicle from passing again into it.   The wound in the scrotum and groin having been stitched, antiseptic dressing was applied.   The whole of the operation was performed antiseptically.

The patient's progress after the operation was satisfactory in every way, and the wounds were healed on the 31st of July.   A few days afterwards, he returned

home with his testicle securely resting in the scrotum in a perfectly natural manner.

In November of the same year, Dr. Robert Irvine was kind enough to write me that he had recently examined the boy, and had found both testicles in the scrotum, and occupying much the same position on their respective sides; the only difference between the two being that the right one felt a little smaller and harder, was more deeply situated, and somewhat more fixed than the left one.

Mr. Curling, in his very valuable work *On Diseases of the Testis*, relates a case very similar to the one just reported, in which he endeavoured to replace and retain the testicle in the scrotum, but he did not succeed in doing so, owing, he thinks, to "the cremaster retracting the organ after the separation of the adhesions which retained it, as the cord was quite long enough to admit of its removal to the intended site." Mr. Curling further remarks: "In another operation, I should endeavour to secure the testicle to the bottom of the scrotum with a suture." The employment of the subcutaneous catgut suture so as to close completely the perineal cavity, in addition to stitching the testicle to the bottom of the scrotum, as suggested by Mr. Curling, insured, I consider, the success of my operation, and I would, therefore, advocate this proceeding in every similar case.

An Improvement in the Treatment of Epididymitis.

In a paper contributed to the *Allgemeine Wiener Med. Zeitung*, Nov. 12, 1878), Prof. ZEISSL, of Vienna, gives an account of the results of the trials he has made of the treatment of this affection pursued by M. Horand, of Lyons.

As to the statistics of the affection, he observes that of 2055 men suffering from gonorrhœa who have come under his care at the hospital during the last eight years, 696 have been attacked by epididymitis, 368 suffering from it on the right side, 302 on the left side, and 26 on both sides. The mode of treating the affection during the last ten years has been the antiphlogistic, consisting in the application of leeches and cold compresses along the course of the cord to the perineum, and the employment of purgatives. Not only has the diet been more or less limited, but the patients have been confined to bed. The scrotum, exhibiting more or less erysipelatous redness with tumefaction, has been kept up constantly by means of a cushion, or raised upon the thighs by a cloth of a hand's breadth passed under it. It is also kept surrounded by a wet compress, over which is laid a small light bladder of ice. In many cases these means suffice in three or four weeks to relieve the tumefaction of the vas deferens of the epididymis, and the inflammatory conditions of the skin of the scrotum and the subscrotal tissue, and to allow of the restriction on diet being removed. Only in exceptional cases, and when the epididymitis has assumed the chronic form, may practitioners apply the unguentum hydrargyri cinereum in moderate quantities to the affected side of the scrotum, continuing the local employment of cold. Formerly many had great dread of the application of cold, under the idea that revulsion of the diseased process to the lungs might be induced, erroneously supposing that some fatal cases of hæmoptysis which have occurred were due to this application of cold. When the pain has been excessive, Prof. Zeissl has applied belladonna ointment (five parts of the extract of belladonna to fifty of simple ointment) spread upon linen or leather; or has had a portion, the size of a nut, rubbed into the diseased side of the scrotum, continuing the cold applications, and securing sufficient action of the bowels.

Although by following this method a very great number of cures of this affection were obtained, yet, owing to several inconveniences it gave rise to, other means of treatment were sought for. One of the earliest of these was that of

Frick, which consisted in submitting the testis to a regulated compression by means of strips of sticking-plaster. This, however, could only be applied after the excessive sensitiveness of the parts had subsided. Even then it required the greatest care, and Prof. Zeissl has repeatedly known gangrene of the integument of the scrotum follow its employment. Also, in other cases in which the compression had been too hastily applied, he has known wasting of the testis to follow. Simplification of the treatment of gonorrhœal epididymitis therefore continued a desideratum; and that the more so because the painful nature of the affection kept the patient entirely away from his employment, while the nature of the affection becoming known often operated mischievously against his interests. It therefore became very desirable to find some means which might at least partly relieve the pain and enable the patient to resume his employment. This seems to be the merit of Langlebert's method as described by Horand, surgeon to the Antiquaille at Lyons, in a work bearing the title "Du Traitement de la Tumeur Blénorrhagique des Bourses par le Pansement Ouato-caoutchouté de Langlebert." In this accounts are given of 200 cases successfully treated; and the present paper furnishes the results of Professor Zeissl's trials with the apparatus in question. This consists of three parts—a layer of wadding of a sufficient degree of thickness, a square piece of caoutchouc cloth, and a suspensory. This last, triangular in shape, and slightly concave, has a hole at its upper edge through which the penis is passed. To its two upper corners are attached two long bands which serve to confine it around the abdomen; and the lower angle is also attached to two bands which surround the thighs, these last being connected with and fastened to the bandage which goes around the abdomen. The patient lying in the horizontal posture, raises the scrotum well enveloped by wadding as high as possible upon the symphysis pubis; and then the square piece of caoutchouc cloth is applied with its shining side towards the wadding, a circular hole having been made in its upper part for the passage of the penis. The suspensory is then put on, and firmly secured to the abdominal band. By this means the scrotum is kept up almost level with the upper edge of the pubes. Horand does not undo the bandage until the end of a week, and if he finds the swelling has not yet disappeared, he continues the procedure or applies a resolvent ointment or plaster.

Prof. Zeissl strongly recommends the procedure, having treated by it since October of this year fifty cases, either in private or hospital practice, and always with most excellent results. He relates a case to which he was called, in which the patient, who had passed five nights without sleep, was suffering fearful pains, every motion and the slightest contact with the testis giving him agony. The Langlebert apparatus was applied, and the patient desired to rise from his bed. This, from the intense pain he had suffered on before trying to do so, he did with great hesitation, but found that he could get up without the slightest suffering, and was able even to walk to and fro in the room. Prof. Zeissl states that he could cite several similar cases, and up to the present time he has never had, in any of the so treated cases, to prescribe anodyne ointments, or to puncture an acute hydrocele produced by the epididymitis. In most of the cases the pain ceased immediately on applying the bandage, or at the very least was so diminished as to allow the patient to pursue his employment. The practice is so simple and so cheap that it is especially suited for hospital practice, the bandage only having to be applied, and all the attendance formerly required, as the application of ice, etc., dispensed with. The suspensory used is far superior to that now commonly employed, there being none of the mischievous pressure from the elastic; while the scrotum is almost completely immobilized, and an exact application is secured by means of the wadding. A very moderate compression is exerted, and an abundant transpiration takes place at the surface of the scrotum.

In all these fifty cases the patients were able to walk about the room, and most of them to follow their employments.—*Med. Times and Gaz.*, Dec. 14, 1878.

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The Diagnosis and Treatment of Ruptured Bladder.

At a late meeting of the Royal Medical and Chirurgical Society (*Lancet*, March 1, 1879), Mr. CHRISTOPHER HEATH read a paper on this subject, of which the following is an abstract:—

The author narrated a case from his own practice, in which rupture of the bladder had occurred forty hours before the patient came under his notice, and in which the lesion was diagnosed principally from the tense condition of the abdomen, from the fact that a catheter, on entering the bladder, drew off clear urine, but, on passing further, gave exit to bloody urine, which ebbed and flowed as the patient breathed, and that warm water injected through the catheter was felt in the groins and abdomen by the patient. Under ether the abdomen was opened, and the opening in the bladder closed with a continuous catgut suture. A catheter was tied in, and gave exit to clear urine till the fifth day, when it became bloody, and symptoms of peritonitis developed, the patient dying just six days after the accident. At the post-mortem examination the lower part of the bladder-wound was found open. Reference was made to Mr. Willett's case, in which a similar proceeding was adopted with a fatal result, and four recorded cases of recovery after rupture of the bladder into the peritoneum were then discussed. They were: 1. Mr. Chaldecott's case, treated by catheterism only; 2. Dr. Walton's case, treated by abdominal section for the removal of the urine; 3. Dr. Thorp's case, treated by catheterism of the peritoneum and washing out; 4. Dr. Mason's case, treated by lateral lithotomy. Having regard to the great difficulty of closing the bladder with stitches, which had now been tried in two cases without success, the author recommended in future cases a trial of the catheterism and washing out of the peritoneum as practised by Dr. Thorp, reserving lateral lithotomy for cases in which the rent in the bladder could not be reached with the catheter.

Mr. BRYANT said the paper was a valuable contribution to the special treatment of rupture of the bladder, associated or not with fracture of the pelvis. He agreed that if any good were to be expected from washing out the peritoneal cavity, it would be only where the operation was done very early after the injury, before any peritonitis had set in. Two things had to be done, viz., to find an outlet for the escape of the urine extravasated into the peritoneal cavity, and, secondly, to provide for the continuous evacuation of urine from the bladder. The first object was met by laparotomy, but the second would be far better attained by cystotomy through the perineum, as in lateral lithotomy. Mr. Heath's procedure of washing out the peritoneum was of value so far as it went, but it could only be in exceptional circumstances that a catheter could be passed through the urethra into the bladder and on through the rent in the bladder into the peritoneum. When this could be done it was an important step, and Mr. Bryant had seen three cases in which the peritoneal cavity was thus emptied of irritating urine. But, save in a few cases, to do this would require much harmful manipulation, and Mr. Heath would probably concur that it would not be wise to search too long for the rent, a search all the more difficult because it had to be made in the contracted bladder. The most important point being to give free vent to the contents of the bladder, a simple incision through the perineum would best effect this, and would allow of the natural closure of the rent in the wall. A case of lacerated wound of the bladder came under his care not long ago. It was a case of a boy of thirteen, who, becoming impaled on a railing-spike, which

entered the right side of the perineum in front of the tuberosity, and, as the boy
fell backwards, the rectum and base of the bladder were extensively lacerated.
Mr. Bryant saw him at once, and, in addition to the injury to the soft parts, found
a lacerated wound in the rectum, through which he could introduce a finger into
the bladder. He made a free section into the bladder through the prostate, and
thus allowed an escape for urine, to which he believed the lad's eventual recovery
was due. This was a case of laceration of the bladder at its base, but in cases of
rupture of the bladder with fracture of the pelvis, where the anterior part was
mostly involved, Mr. Bryant thought more active measures than were customary
should be taken. In a case of fractured pelvis and lacerated urethra, where Mr.
Bryant only made a free incision into the perineum, no urine escaped, and it was
necessary to tap the bladder afterwards per rectum. On the patient's death the
urethra was found to be torn completely across, the two portions being separated
by at least two inches, and a large cavity containing urine had formed beneath
the pelvic fascia. It would have been better to have extended the perineal inci-
sion into the bladder. He had post-mortem records of two similar cases, and he
urged, therefore, that when the surgeon failed to give free enough vent by
perineal section, he should greatly extend his incision ; and whether the rupture
be in the posterior or anterior part of the bladder, the principle was the same.
He suggested that Mr. Heath's plan of washing out the peritoneum might be
better effected after cystotomy had been performed.

Mr. HOLMES differed from the conclusion arrived at by Mr. Bryant, that the
result of the cases of Messrs. Willett and Heath proved the unjustifiability of the
operation. On the other hand, they seemed to be very encouraging for the repe-
tition of this operation, if performed at a very early period. In both cases the
fatal issue was distinctly due to the giving way of sutures, so that neither could
be quoted against the probable efficacy of the operation. He could not under-
stand why the urine would flow out of the perineal wound rather than through
the rent in the bladder into the perineum ; and if the cystotomy wound at any
time closed it would determine the escape of urine into the peritoneum. But
Mr. Bryant wished to supplement his proposal of cystotomy by the practice of
washing out the peritoneum from above by a catheter introduced into the blad-
der. When the great extent of the peritoneum is considered it would seem im-
possible thoroughly to wash this out. He believed that when the wound in the
bladder could be closed by sutures the chance of recovery was much heightened,
and Mr. Heath's case showed the great improvement that took place until fresh
extravasation ensued. Mr. Holmes then related the case of a man who for the
first thirty-six hours after injury presented no symptoms of rupture of the bladder
except retention of urine, and who suffered so little that he walked to the hospi-
tal, but in a short time died from peritonitis, and a large rent was found in the
bladder, and a quantity of urine in the peritoneal cavity.

Mr. HEATH, in reply, said he did not exclude cystotomy, which indeed he
held to be advisable when the peritoneum cannot be otherwise catheterized. It
was most essential to wash out the peritoneum, and if this could not be done
through a catheter in urethra and bladder, then it must be through the cystotomy
wound. The question of diagnosis was extremely difficult. If this patient had
not died, one of his (Mr. Heath's) colleagues would have remained sceptical as
to the case being one of complete rupture. The points relied on by Mr. Heath
were : (1) passage of catheter for its whole length, and its perfect freedom at its
extremity ; (2) the passage of clear urine on first introducing the catheter, and
then of bloody fluid ; (3) the impossibility of distending the bladder on injecting
water. This he looked on as of most value, and pointed to another case where,
in a few minutes, a great sense of distension was complained of, proving that the

viscus was not torn. The yielding of the suture in his case was due probably to the fact that it was a catgut suture, which he had perhaps cut off too close to the knot. He believed the peritoneum could be effectually washed out through the rent in the bladder, for in that way the whole peritoneal sac could be distended with water. He did not mean to say that he should not repeat the operation, but wished to enforce the fact that the unaided surgeon had far better rely upon free washing out and catheterism than attempt to treat a case of ruptured bladder by cystotomy or abdominal section. He could conceive of a cystotomy being done and attended with fatal result in a case where there was no rupture at all.

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Ligature of the Common Carotid in Ulceration of the Internal Carotid Artery.

At the meeting of the Surgical Society of Paris, on October 9, M. HERMANN (of Mulhouse) read a paper on ligature of the common carotid in cases of ulceration of the internal carotid. A patient with abscess of the tonsil had suddenly profuse hemorrhage. Happening to be in hospital at the time of the accident, M. Hermann was able, in spite of great swelling in the neck, to apply a ligature to the main artery. The patient recovered. M. Hermann considered that phlegmon of the tonsil could bring about ulceration of the large vessels ; the internal carotid was more often affected, yet he cited observations where the bleeding came from the branches of the external carotid. In a great number of cases, ulceration of the wall of the artery was favoured by a bad state of health, or by an increase in the blood-supply, yet his case proved that it was not always so, as the phlegmon of the tonsil was the only cause of ulceration of the carotid. In these cases it was better to tie the common artery, as it was difficult to know the exact source of the bleeding, whether from the external or the internal carotid.

M. Tillaux thought it was very desirable to establish a correct diagnosis, as, if the blood came from the external carotid, ligature of the common artery would not stop the hemorrhage, as the anastomoses of the internal carotid would reestablish the circulation. A large supply of blood did not suffice as an argument, for under the influence of inflammation the vessels of the tonsil were largely developed.—*London Med. Record*, Dec. 15, 1878.

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Excision of Entire Scapula.

Dr. MIKULICZ reports the case of a child whose scapula had been excised by Professor Billroth for disease, in last March. Two incisions were employed, one parallel and a little above the spine of the bone, the other at right angles to this, so as to open the shoulder-joint. The periosteum was found to be nearly entirely detached, the raspatory being only required at the angles and the edges. The coracoid and acromion processes were snipped off. Listerism was used, and primary union took place, it being found only necessary to dress the wound twice, viz., on the sixth and eighth days after the operation. The patient returned to the clinic in October, and it was then seen that the scapula had been reproduced. The new bone was smaller in every way than that on the sound side. The movements of the arm were free, but elevation of the limb could not be accomplished so freely as in the normal arm. The bone that had been excised was exhibited.—*London Med. Record*, Feb. 15, 1879.

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Removal of the Radius by Absorption.

Dr. NEDOPIL relates in the *Wiener Medizinische Wochenschrift* for December 7, 1878, the following rare case, which occurred in Dr. Billroth's out-patient

practice at the University Clinic. Josepha Z., a cook, aged 34, applied, in June, 1878, for relief on account of a constantly increasing contraction of the left forearm. In 1868, she was delivered of a child, which died when six years old with symptoms of scrofula; according to her account, the father had syphilis. In 1873 (having been previously in good health), she had serpiginous ulcers of the right thigh; and in 1874 she had disease of the left knee, from which she suffered for three years. The knee swelled spontaneously: the swelling disappeared when she was able to rest, but returned as a result of exertion. She was first treated in hospital early in 1876, for white swelling. As there was no improvement, she left the hospital in August; and in the following October (1876) an abscess formed over the patella, and two small pieces of bone were discharged. Soon afterwards, the knee healed. During her stay in hospital, the radial half of the left forearm became painful and swollen, and the use of the hand became impossible. Local applications of tincture of iodine and warm moist bandages were ordered; and the patient soon ceased to attend. The pain and inability to use the hand lasted about nine months; and when the swelling and pain disappeared (about September, 1877), she observed a constantly increasing deformity of the left wrist, on account of which she again presented herself at the hospital. The left patella was smaller than the right, and the loss of substance which it had undergone had divided it—as if it had been fractured—into two fragments. The knee-joint itself was healthy. The left forearm was distinctly smaller in circumference than the right (14 *centimètres* against 17½). There was subluxation of the hand towards the radial side. On palpation, no trace of the diaphysis of the radius could be found. The epiphyses were both present; their ends were directed towards the ulna, and could be rather extensively moved by passive motion. Supination was much impeded; the other movements of the hand were perfectly free and strong. On forced passive flexion, the muscles on the radial side of the arm contracted strongly; but it could not be ascertained with certainty whether the epiphyses of the radius were connected by a firm band. In a note to this case, Dr. Billroth refers to a case shown him by Dr. Barbieri of absorption of the lower jaw, without suppuration, but with much pain, in a man about fifty years old. He mentions also a preparation in the pathological museum at Zürich, of a tibia of which only the epiphyses and a diaphysis about as thick as a crowquill remains: it is catalogued as "concentric atrophy of the tibia."— *British Med. Journal*, Feb. 15, 1879.

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Treatment of Neuralgia of the Superior Maxillary Nerve by Resection of the Infraorbital Nerve in the Orbital Cavity.

Dr. LASALLE (*Thèse de Paris*, 1877; and *Bulletin Général de Thérapeutique*, November 30) is of opinion that resection of the nerve is the only efficient way of healing, or at least soothing, inveterate chronic neuralgia. It ought to be performed either beyond the painful branches, or between them and the root of the nerve, but as far as possible from its termination. In cases of peripheric neuralgia the pain ceases almost instantaneously after the operation, but if its cause be in the nervous centres, the pain is only temporarily calmed. Having duly considered all these points, the author gives it as his opinion that the most favourable spot for the resection of the nerve is the orbital cavity, the operation being neither difficult nor the consequences dangerous. This situation is, therefore, preferable to the pterygo-maxillary fossa, where it is very difficult to perform the operation. It is also attended by much danger, so that it ought only to be made when the neuralgic pains have been caused by some traumatic affection of Meckel's ganglion. Dr. Lasalle thinks it also advisable to remove the whole of the superior

maxillary nerve instead of simply dividing or resecting it within the orbital cavity, as these operations only afford a momentary relief.—*London Med. Record*, Feb. 15, 1879.

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Suture of Nerves.

Dr. BAKOWIECKI, working in the histological laboratory at Kiew (*Gaz. Médic. de Paris*, October 26, 1878) on the condition of nerves after suture, finds that the suture of nerves considerably hastens their cicatrization, and the re-establishment of their functions; that it is necessary to unite the cut nerves within twenty-four hours of their section, and to perform the operation in such a way as to prevent the ligature from passing through any structure except the neurilemma; and that sutures of catgut must be alone employed, as they do not cause suppuration, whilst they are wholly absorbed in the wound. Suture prevents the appearance of tetanus. Eulenberg and Landois obtained negative results because they passed the ligature through the whole thickness of the nerve. The experiments of Dr. Bakowiecki were made upon various animals; they were one hundred in number; the nerves sewn were the sciatic, vagus, and hypoglossal. The sutures employed were of silk, silver, and catgut prepared by Lister's method. The microscopical appearances seen were in the negative cases, in which no regeneration of the nerves took place, destruction of the axis cylinders. In the positive cases, in which there was regeneration of the nerve-fibres, a bud made its appearance at the end of the axis cylinder of the nerve. After a lapse of thirty days, filaments (axis cylinders) were seen, which appeared to consist of fusiform cells communicating with each other by their prolongations. Around the filaments a pale contour line could be distinguished; this line the author believes to be the medullary sheath. The filaments themselves join directly the original nerve-fibres of the central end of the cut nerve. The author supposes that new nerves are thus formed, and he bases his supposition upon three facts. In the first place, the filaments just described pass directly into the nervous fibres. Secondly, the portion of regenerated nerve is composed of these fibres. The nerve, when so formed, is found to have recovered its functional properties. Lastly, the filaments are strongly stained by carmine, and they act in the presence of certain chemical reagents in exactly the same way as do the true axis cylinders. The pale contour-line is supposed to be the medullary substance of the nerve, and not the neurilemma or sheath of Schwann, because no nuclei have been found in it.—*London Medical Record*, Feb. 15, 1879.

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Nerve-Stretching in Tetanus.

Dr. J. J. L. RATTON, Professor of Surgery at the Medical College, Madras, has published a small pamphlet with the praiseworthy object of encouraging the study of tetanus, and especially its treatment. Hospital statistics which he gives show that the disease at Madras is most prevalent and fatal in April, and least so in September and December. It affects natives more than it does Europeans, apparently because the native is more exposed to the changes of temperature between night and day. He has had more cases in patients kept in sheds out in the open air than in the wards of the general hospital; and cases frequently occurred after a rain storm. Regarding treatment, he is most in favour of chloral hydrate, but it must be given very boldly and continuously in heroic doses, kept up for at least a week or ten days. Drachm doses should be given every two or three hours till the patient is so far narcotized that he lies in a state of sleep, from which he can be roused to take food in a mechanical way at intervals. When the narcotism has been established the medicine may be given less frequently. Dr.

Ratton declares that it is worse than useless to give the chloral timidly or intermittently. He devotes some attention to nerve-stretching, of which his impression is favourable, as a means " of modifying the conductivity of the whole nerve, from its roots to its termination, and of establishing a new and healthier action in it." He gives four cases in which he performed this operation, but of the four three were fatal, although the *clonic* spasms of the limbs appeared to be controlled. The patient who recovered was kept under the influence of chloral for a fortnight after the operation. The other patients died from exhaustion, and would probably have died under any treatment. Dr. Ratton does not seem to think the carbolic spray essential to the operation of nerve-stretching, and, curiously enough, seems to consider that suppuration in the course of the nerve that is stretched is " an important factor in the remedial action of nerve-stretching."—*Med. Times and Gazette*, Jan. 18, 1879.

OPHTHALMOLOGY AND OTOLOGY.

Ophthalmoplegia Externa or Symmetrical Paralysis of the Ocular Muscles.

At a late meeting of the Royal Medical and Chirurgical Society (*Lancet*, Feb. 15, 1879) Mr. JONATHAN HUTCHINSON read a paper on this subject. He commenced by stating that the term ophthalmoplegia had been used by Graefe ten years ago in reference to the class of cases dealt with in this paper; and that more recently Eulenberg, writing of the same cases, had applied the appropriate adjective, progressive. The affection had not, however, he believed, received any notice from English writers. Most of its best marked examples occurred to adults who had suffered from syphilis many years before, but it had been recognized in connection with inherited syphilis, and in some cases without any assignable cause. Its essential feature is bilateral paralysis of the external muscles of the eyeballs; and it sometimes proceeded to such an extent that the eyes were almost motionless in their orbits, and the patient compelled to move his head from side to side when he wished to change the direction of vision. A remarkable fact, however, is that the paralysis rarely proceeds to absolute paralysis, and rarely affects all the muscles in the same degree Sometimes one or two wholly escape. The lids always droop over the eyes, giving to the patient the appearance of being half asleep; but it is seldom that there is complete ptosis. Ophthalmoplegia interna and paralysis of the iris and ciliary muscle is often present also, but it may be wholly absent. In some cases the optic centres are affected, and blindness with white atrophy results. The facility with which the progress of the disease is influenced by iodide of potassium probably in large measure accounts for the frequent incompleteness of the paralysis, and for the circumstance that it does not always manifest progressive tendencies. In advanced cases the spinal cord is affected, and symptoms of locomotor ataxy are developed, or other forms of paralysis. The author then proceeded to narrate in abstract the particulars of fifteen examples of the malady, thirteen of which had been under his own observation, and two under that of Mr. Warren Tay. In the study of several of these cases he had to acknowledge the able assistance of Dr. Hughlings-Jackson, and in the only one in which an autopsy had been obtained Dr. Jackson was present at it, and the microscopic examination of the brain had been made with great care by Dr. Gowers. The following summary of the clinical evidence was appended: "The facts are too few to admit of statistical analysis, but a brief summary may perhaps be useful. Of the fifteen cases four only occurred in females, and two of these were children. One of the males

was a boy the subject of inherited taint, and the remaining ten were all adults. In eight of the fifteen it seemed certain that syphilis was the cause, in six acquired and in two inherited. Of the remaining seven, it may be said that a reasonable suspicion of syphilis might be entertained in several. Had it not been for an almost accidental revelation of the truth in the case of the man S., after prolonged fruitless investigation, I should certainly have asked the Society to believe that his was an example of the disease without any probability of syphilis. With such a fact in mind, one feels that it is almost impossible to make the negative even fairly probable. In Case 9 no direct question was asked, the patient being a single woman; in the two young children, although nothing could be proved, there were some suspicious facts, and one recovered under the iodide. The case in which evidence is most conspicuously absent is No. 13; but in this the patient is a young man, who may have denied the true history, or who may have either inherited a taint or had acquired disease in some irregular way of which he knew nothing. On the whole, the evidence which connects this affection with syphilis is exceedingly strong, and that which favours the belief that it can occur independently of it must be held to be open to some doubt. In five of the patients, all but one known to be subjects of syphilis, the optic nerves were affected, and blindness with white atrophy resulted. In two cases the fifth nerves were symmetrically affected, and in two there was slight affection of the facials. The almost constant escape of the facials must be held to be a remarkable fact. In one case the palate was affected, and in one—the same patient—smell was lost. None of the patients were deaf, and none had lost taste, and in only one was there any material anæsthesia of the skin of the face. In six cases the lower extremities were more or less weak and liable to pain, the condition approaching more or less closely to locomotor ataxy. I much regret that, owing to imperfect knowledge on my part at the time of their occurrence, the details of facts in reference to this disease are often incomplete. There can, however, be no doubt that ophthalmoplegia externa is sometimes a part of the general malady known as progressive locomotor ataxy, especially when that disease is due to syphilis. One of the patients became insane, and another was liable to attacks of violent mental excitement. Four of the fifteen are known to be dead, but of these a post-mortem was obtainable in only one. In several cases, owing either to the blindness or the youth of the patient, it was impossible to estimate the state of the accommodation, but in a certain number it was proved to be perfect, in a few it was absent, and in a few it varied. The pupil never contracted, was almost always sluggish and of medium dilatation. In one well-marked case it acted fairly. In no single case was it very widely dilated. From these facts we may infer that the lenticular ganglion is often free from disease, and that the vaso-motor filaments, although often enfeebled, are not usually paralyzed. It is difficult to make any confident statement as to the progressive tendencies of the malady of which ophthalmoplegia is a symptom. It is very definitely influenced for good by treatment, and in nearly every case specific measures were adopted. We may conjecture, however, from what happened in several, that in most instances it is an aggressive malady, and would end fatally if treatment were not resorted to. The effects of remedies in several of the cases were very remarkable, the patient being rescued from a very dangerous condition. At the time that most of the cases were under treatment, my opinions as regards the nature of the malady were far less clear than at present, and hence a hesitancy in treatment which was probably often prejudicial. The patients were benefited up to a certain point, but relapses occurred, and the remedy was not pushed sufficiently. It would seem that the iodide of potassium is by far the best means of treatment, and that it ought to be given over very long periods and in increasing doses without

any limit as to precise quantity, excepting its effect on the symptoms. Although relapses are common, yet in several of the cases related a complete arrest appears to have occurred, no treatment having been resorted to for several years. In none, however, was the recovery complete."

Dr. BUZZARD said that there was at present under his care in hospital a young woman, twenty-five years of age, who contracted syphilis eight years ago, and who now was a marked instance of the affection described in the paper. She presents a symmetrical paralysis of all the orbital muscles on each side, with the exception of the left external rectus. The syphilitic history was interesting, and equally so was the fact that she was also the subject of locomotor ataxy in a pronounced degree. She had the ataxic gait, anæsthesia of the soles of the feet, sense of constriction in the abdomen, loss of control over sphincters, absence of patellar tendon reflex, and further suffered from severe "gastric crises"—i. e., attacks of gastralgia, with nausea, vomiting, and sometimes diarrhœa. There was also wasting of the scapular muscles, particularly the rhomboids, of one trapezius, and one pectoralis major muscle. It was remarkable that all these changes should have been set up within two years and a half, and he thought the case bore out Mr. Hutchinson's suggestion that in "ophthalmoplegia externa" there is disease of the motor nerve nuclei of the eye parallel to that occurring in the anterior cornua of the spinal cord in progressive muscular atrophy; for this patient not only had the ocular paralysis conjoined with wasting of other muscles (exceptional in locomotor ataxy except as a late event) but had also those marked gastro-intestinal phenomena which might be attributed to lesions about the vagi nuclei.

MIDWIFERY AND GYNÆCOLOGY.

A Duplex Uterus with Double Conception.

Dr. SOTSCHAWA, of Moscow, relates (*St. Petersburg Med. Woch.*, Jan. 25) the case of a woman, aged twenty-six, who applied to him on account of hemorrhage occurring during her third pregnancy. On examination it was found that there were two distinct vaginæ, each leading to a uterus. The finger passed up readily through the first of these so as to be able to feel the presenting ovum, the uterus seeming to correspond to about the second month of pregnancy. The vagina on the other (the right) side was more narrow, but allowed the cervix of what seemed a third-month uterus to be felt. Hemorrhage was taking place from both uteri, and, in consequence of this being considerable, an embryo of a month old was removed by the finger from the left uterus; and three days later a three-months fœtus was extracted from the right uterus. The author observes that the case is not only remarkable for its rarity (only thirty similar cases being on record), but also as testifying to the probability of superfœtation.—*Med. Times and Gazette*, Feb. 22, 1879.

Treatment of Tubal Pregnancy.

Dr. VEIT (*Deutsche Zeitschrift für prakt. Med.*, No. 49, 1878) says that about one-fifth of the cases of hæmatocele are due to rupture during tubal pregnancy; and that the latter is more frequent and capable of a more favourable prognosis than is generally supposed. In the rare cases in which an early diagnosis of tubal pregnancy can be made, expectant treatment is indicated. When rupture occurs, an attempt must first be made to arrest the hemorrhage by external means; and,

as a last resource, laparotomy must be performed, although it does not afford a very good chance. The method of arresting the hemorrhage will vary in different cases; sometimes it will consist in the application of sutures, sometimes in removal of the sac, etc. Dr. Veit performed laparotomy on a moribund patient to arrest the hemorrhage produced by rupture in tubal pregnancy. The Fallopian tube was tied, the sac sewn to the lower angle of the wound, and plugged with salicylized cotton-wool. After two days, plastic peritonitis set in, of which the patient died sixty-four hours after the operation.—*British Med. Journal*, Feb. 15, 1879.

Labour with Cleft Pelvis.

Dr. A. GUSSEROW (*Berliner Klin. Wochenschrift*, Jan. 14, 1879) had the following case under his care 17th November, 1878, in the Charity Hospital. A girl, aged 19, came to the hospital in labour. She was the subject of ectopia vesicæ. The following is a translation of the account of the condition, presented. "At the lower third of the anterior abdominal wall was the posterior wall of the bladder. It was red and covered with a moist mucous membrane 7 centimètres broad and 5 centimètres long. At the lower margin of this membrane were seen the two openings of the ureters from which urine dribbled continuously, and frequently spurted out a distance of a foot under the contractions of the abdominal walls, and during labour pains. The skin over the abdomen in the neighbourhood of this projecting posterior wall of the bladder was cicatricial in appearance, and of a brownish hue. No umbilicus was to be seen. Underneath, the wall of the bladder was continued as a fold of skin about 2 centimètres broad, of a bright red colour, but not showing the characters of mucous membrane, although part of it was regarded as being the posterior wall of the urethra. Under this was the opening of the vagina, 3 centimètres long and 5 centimètres broad, which was irregular in shape, owing to the absence of the sphincter vaginæ. This opening was surrounded by two very rudimentary, irregularly shaped projections of skin, which represented the labia majora and minora. At the upper margin of the opening were two well developed folds of skin, which were the divided corpora cavernosa of the clitoris. Under the skin could be felt and seen the two ends of the divided rami of the pubes, about 8 centimètres apart. The interspace was partly filled in by the posterior urethral wall, and partly by skin spreading from the integument covering the pubic rami. The outer margins of this skin were sparsely clothed with pubic hair. From the lower margin of the vaginal opening was stretched a tense perineum 4 centimètres in length, which, together with the anal aperture, appeared to be directed forwards and upwards. This unusual condition was further complicated by the protrusion, through the small and irregularly shaped vaginal opening, of the child's foot as far as the ankle, and a pulseless loop of knotted umbilical cord, which had also prolapsed." The waters had burst two hours before her admission into the hospital. Although the uterine contractions were powerful, the labour did not progress, and Dr. Gusserow made two incisions from the sides of the vulvar opening towards the tuberosities of the ischia. This he did to enlarge the opening and to avoid the rupture, which appeared imminent, of the posterior bladder wall. The delivery of the child and placenta was then readily effected. Lying-in normal. Dr. Gusserow states that up to the present time only five cases of labour have been observed in similarly deformed pelves. The first by Bonnet, 1722; the second by Ayres, 1859; the third by Litzmann; and the fourth and fifth by Günzburg, who published them in the *Petersburger Medizinische Zeitschrift*, 1872–73.— *London Med. Record*, Feb. 15, 1879.

Cæsarean Operation with Removal of the Uterus and Ovaries.

Prof. Gustav Braun related (*Allg. Wein, Zeit.*, Dec. 17, 1878) to the Vienna Medical Society an instance of this operation which had just occurred in his practice. A rickety primipara of extremely small stature, with a very large head, was brought into the Midwifery Klinik, December 12, the liquor amnii already discharged, and the labour pains having commenced. On examination, the measurements of the pelvis were found to be so extremely small that craniotomy could not be safely performed, and the Cæsarean section was at once resorted to, as the action of the child's heart had begun to fail. The child having been extracted, the uterus and ovaries were removed by means of the écraseur, which had been previously applied. The placenta was not removed, but remains attached to the preparation of the removed uterus, the bleeding which occurred being quite insignificant. Prof. Braun observed that this made the fifteenth case now recorded in medical literature in which this procedure had been employed, and nine of these terminated favourably. It is to be expected that in the future this operation will be more frequently resorted to, as by this method great losses of blood and other inconveniences can be avoided.—*Med. Times and Gazette*, Jan. 18, 1879.

Relation between the Age of the Mother and the Sex of the Child.

Bidder, in the *Zeitschrift für Geburtshülfe und Gynäkologie*, Band 2, gives the results of his observations on this subject. In 4,441 primiparæ, the proportion was 100 female to 111.5 male children. Very young primiparæ gave birth to a large proportion of boys; those of twenty or twenty-one years old, had more girls than boys; while, as the age increased, the proportion of male children again rose. In 7,430 multiparæ, there were 100 female to 112.4 male children. The proportion of males exceeded that of females in those aged from seventeen to twenty-one; the number sank in the twenty-second and twenty-third years, reached its minimum at the ages of twenty-four and twenty-five, and then again increased in proportion to the age of the mothers.—*British Med. Journal*, Jan. 25, 1879.

Use of Jaborandi, or Pilocarpine in the Treatment of Puerperal Albuminuria and Convulsions.

In a paper read before the New York State Medical Society (*Med. Record*, March 1, 1879) Dr. Fordyce Barker narrated six cases of puerperal albuminuria which he saw in consultation, from the study of which and of cases reported by others he has become convinced that the utility of jaborandi is more than doubtful, and that, after puerperal convulsions, its depressing influence and action, which is continuous and exhausting, prevents sleep and the repose of the nervous system, and thus renders it in these cases an unsafe and dangerous remedy.

Dr. Strognowski (*Centralblatt für Gynäkol.*, 1878, No. 20, and *Medicinisch-Chirurgische Rundschau*) after having tried in vain to calm an eclamptic patient by a hypodermic injection of morphia, resolved to try some other method. He accordingly injected a syringe-full of 2 per cent. solution of pilocarpine. Two minutes later the usual symptoms, profuse perspiration and salivation, had begun; the patient grew calm and fell asleep; and after three hours labour-pains began. A second injection was then made, five hours after the first. The child was extracted with the forceps. The mother was perfectly cured of the disease. The quantity of albumen in the urine, which had at first been very considerable, disappeared within eight days.

On the Use of Solution of Perchloride of Iron as a Styptic and Caustic in Gynæcological Practice.

Dr. MATTHEWS DUNCAN records (*Edinburgh Med. Journal*, Feb. 1879) a case of death from injection of perchloride of iron into the uterus, and prefaces it with some remarks from which the following extract is made:—

Like most, if not all, gynæcologists, I have for a long series of years been in the habit of using locally strong and weak solutions of perchloride of iron, generally the former, in various ways, with various objects in view; and, except occasionally much pain and a very rare adhesive perimetritis or phlegmasia dolens, I have seen, amid advantageous results, nothing to counterbalance the good, till the case, to be now related, occurred. As a styptic in all extreme forms of uterine bleeding, and in connection with early abortion and uterine diseases and operations, and in vaginal and vulvar diseases and operations, as a caustic in endometritis, I have applied it without stint. It is recommended, in most works on gynæcology, to be used in such ways, and in others, as by injection into cancerous tissues. I have always injected it gently, that is, under slight pressure, and have used little at a time, not more than a drachm. If more was used, I have paid attention to the previous dilatation of the cervix.

Von Haselberg, Barnes, and Kern[1] have related cases of passage of the iron solution through a Fallopian tube, but of this I have seen no example. In Von Haselberg's case the occurrence was explained by the open condition of the tube.[2] Klemm, whose work, *Ueber die Gefahren der Uterin-injection*, is referred to by Schroeder, but which I have not seen, is the only author whom I know that refers to the danger of injected fluids passing into uterine sinuses, and then into veins in the broad ligament. His data seem to have been the results of experiments, and are no doubt of great value.

The following case demonstrates the passage of the iron solution through the uterine sinuses into the veins of the broad ligament and the mode in which death was produced. In consequence of it I intend now to make use of tincture of iodine, hoping for results like those of the iron solution without its attendant dangers. The following is an abstract of the history of the case:—

The woman was suffering from ulceration of the cavity of the body of the uterus, which was supposed to be malignant. She had much bloody and watery discharges from the vagina, and was very anxious that some attempt should be made to stop it and cure her. The uterus was enlarged and retroflected, the cervix large and patulous. Through the latter, after dilatation, the finger could be passed into the cavity of the body of the uterus. Nitric acid was first used, and subsequently the iron solution. It was the second injection of the solution of perchloride of iron that was followed by disaster. Till this, benefit of a temporary kind was gained from the injection.

After the second injection, which was made with the greatest ease and gentleness, she had pain in the hypogastrium of great severity, with weakness and symptoms of extreme prostration, yet she was able to walk from the operating theatre to her bed in the large ward Now came on the most alarming appearance of impending death, which I said to the bystanders could be accounted for only by embolism, the abdominal pain and every indication of peritonitis being absent. But I could not account for the embolism. I had not then any knowledge of Klemm's experiments. Under treatment she partially rallied. Her death was sudden, and quite unexpected at the time by the very intelligent sister, who

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[1] See Schroeder, Handbuch der Krankheiten der weiblichen Geschlechtsorgane. 2te Aufl. s. 129.

[2] On this subject see Edinburgh Medical Journal, June, 1856, p. 1057.

happened at that minute to be standing by, engaged in conversation with her. Death occurred nearly two days after the injection.

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A New Method of Removing Submucous and Interstitial Fibroids of the Uterus.

Dr. T. GAILLARD THOMAS advocates (*Med. Record*, Feb. 8, 1879) the removal of these forms of uterine tumours by seizing the most dependent and accessible part of the tumour with a strong vulsellum forceps, passing along its sides his *serrated scoop, or spoon-saw*, and by a gentle pendulum motion from side to side, sawing through the attachments of the tumour and forcing it entirely from its connection with the uterus.

The advantages claimed for this instrument are the following :—

1. The attachments were separated by a saw which greatly limited hemorrhage.

2. The shape of the spoon, convex without and concave within, caused it to follow of itself the contour of the tumour, and at the same time protect the uterine tissue.

3. The highest attachment could be as readily reached as the lowest.

4. The saw action secured separation with rapidity and with certainty.

5. The spoon-saw secured separation of the growth at its highest point of attachment, and left no peduncle to decompose.

As regards the size of tumours which can be thus removed, Dr. Thomas says that in any case in which the vulsellum forceps could be fixed in a fibrous tumour of a size sufficiently small to admit of its delivery by the vagina, detachment of it from the uterus could always be accomplished by this method. The accident of cutting into the peritoneum was less likely to occur than when enucleation was employed.

Any tumour which could be completely accommodated in the pelvis could be delivered without diminution in bulk ; but sometimes a projecting part of the tumour might fill the pelvis completely, and still a larger portion might remain above the superior strait, which could not be drawn through without mutilation. Under such circumstances, he recommended the following methods of delivery :—

1. Seize the tumour with strong forceps, draw it down, sever the distended perineum to the sphincter ani, partially or completely invert the uterus, detach the tumour by the spoon-saw, replace the uterus at once, and close the perineum by sutures.

2. Successive sections of the tumour might be cut away by means of the galvano-cautery wire.

3. A large trocar and canula, or the actual cautery, or the trephine obstetric perforator, might be used to channel up the middle of the tumour, and then, with a strong pair of scissors or osteotome, pieces could be cut out, and the tumour so diminished in size that it was susceptible of delivery.

That either of these ways were better than enucleation or the production of sloughing, he had not the slightest doubt, from his own observation and experience.

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A Series of Fifty Ovariotomies.

The *Berliner Klin. Wochenschrift* (No. 1, 1879) contains a table of fifty most recent ovariotomies performed by Professor SCHROEDER according to the strict antiseptic method. They extend over the period from February to December, 1878. Seven patients, or 14 per cent. died ; and forty-three, or 86 per. cent., recovered. All the deaths occurred in very difficult and complicated cases. In

one the immediate cause of death (in the second week) was adhesion of the pedicle to the wall of the pelvis, so as to strangulate the rectum ; another patient died from shock ; a third had myxomatous degeneration of the whole peritoneum. The remaining four died, one from fatty degeneration of the heart, the three others from septicæmia. Professor Schroeder remarks, with regard to the latter, that it appears impossible, either with the strictest antiseptic precautions, to be absolutely certain of excluding septic germs from the abdominal cavity. He also thinks that while a few such germs might be nearly innocuous to a healthy organism, they acquire greater virulence in a depressed and diseased subject, with numerous wounds to afford them a congenial proliferating surface. He also points out that, after loss of blood, the ''suction power'' of the circulatory apparatus will be more vigorous, and hence the penetration of the germs to distant parts of the system more easy. Two of the cases were complicated with pregnancy, and both ended favourably as far as the mothers were concerned. Professor Schroeder has as yet operated five times in pregnant women, the diagnosis in each case having been previously made. All five recovered. Three were normally delivered at term ; one aborted after the operation ; and the fifth gave premature birth to a living child, which, however, afterwards died of general weakness. The operation is best performed in the first half of the period of pregnancy. Later on the broad ligaments receive such an abundant blood-supply, and the pedicle of the tumour becomes so much shortened, that the operative difficulties and dangers are decidedly increased. With reference to a case in which the tumour removed was very small—not larger than a duck's egg—Professor Schroeder remarks that such small tumours are more difficult to operate on than those of medium size. Both here and in Battey's operation for the removal of normal ovaries, he makes the incision in the linea alba long enough to introduce the whole hand into the peritoneal cavity, and so bring the ovary or growth outwards, ligature, and remove it. Tumours of unusual size, on the other hand, are troublesome because their removal leaves '' too little to fill the abdominal cavity, and too much wall to cover it.'' If the intestines and mesentery are not of sufficient size, it is difficult to expel the air, which always enters the abdomen when its wall is incised, after the operation. This air may or may not be free from septic ''germs.'' If free, its presence is of no importance, as it is sure to be absorbed ; but of course it is impossible, as above remarked, to insure this. Professor Schroeder, therefore, is accustomed, '' if the intestine does not sink of itself into the pelvic cavity, to pack the latter with the sigmoid flexure of the large intestine, and then with coils of small intestine, and to spread the mesentery over all. It is thus easy to expel the air before the last sutures are secured.'' If, however, the mesentery is, as happens in cases of some very large tumours, too short to allow the small intestine to descend, there is nothing for it but to press the flaccid abdominal walls deep into the pelvis, and thus expel the air. This, of course, renders the accurate closure of the wound by sutures much more difficult. In two cases Professor Schroeder has even removed a piece of the abdominal parietes, but only one of them benefited materially by the excision. This was a case where the portion removed included the sac of an umbilical hernia the size of a man's fist.—*Med. Times and Gazette*, Jan. 18, 1879.

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Triple Ovariotomy.

Cases in which the presence of a supernumerary ovary has been discovered are very rare, and we believe that the following case of triple ovariotomy, performed by Dr. Winkler, of Dresden, is unique : Emily S———, thirty-nine years of age, confined seven years previously, was seen in July, 1877. She had observed

a tumour for about six years, and had had several attacks of severe peritonitis. The tumour was evidently bilocular, one large cyst filling the cavity of the abdomen, and the other that of the pelvis. She was tapped in July, and Dr. Winkler performed ovariotomy in August. The large cyst was extensively and firmly adherent to the abdominal wall in front and behind, also to the liver and omentum. The smaller cyst occupying the pelvis was not adherent. The pedicle was attached on the left side. It was tied and dropped into the pelvis. The right ovary was found to contain a mass of small cysts ; its pedicle was also tied and dropped. While cleaning the cavity of the belly, a fact diagnosed previously was verified—namely, that there was present considerable mobility of the right kidney. But in the left half of the pelvis was also found a tumour containing two small cysts. The pedicle was tied and dropped. The cavity of the abdomen was drained, but the patient died of septicæmia on the fourth day. Ovarian tissue was found in each of the tumours removed, and it was evident that two ovaries were present on the left side, inasmuch as there were two distinct tumours, each possessing a distinct and separate origin.—*Lancet*, Feb. 15, 1879.

A Case of the Double Operation of Ovariotomy and Hysterotomy.

Dr. W. H. BYFORD, of Chicago, reports (*Am. Journal of Obstet.*, Jan. 1879) the case of a young unmarried lady, aged 23, of "unblemished reputation," who was brought by her physician to see him in consultation about an ovarian tumour which had been first noticed about one year before, and had grown more rapidly in the last six months ; the menses had ceased "several months since ;" a vaginal examination was shrunk from by the patient, and was not insisted upon as being absolutely necessary. The diagnosis of an ovarian tumour, probably of the left ovary, and mono-cystic ovariotomy was performed, and twelve quarts of an amber-coloured fluid drawn off. "When the sac was nearly emptied, I noticed a tumour behind it, adhering to the sac and preventing it from passing out through the incision. The second tumour was elastic, and so perfectly resembled a secondary cyst, that I had no hesitation in plunging the trocar through its walls with a view still further to lessen the bulk of the entire mass by evacuating its contents. As the trocar met with unusual resistance, and nothing but blood passed through it, I became convinced that there was something unusual about it. The incision was somewhat enlarged, and, as much of the emptied sac drawn out as would pass, when it was discovered that slight adhesions, and not continuity of tissue, connected the two. After the cyst was entirely withdrawn, I was astonished to find that the second tumour was the impregnated uterus, and still worse, that it was wounded and bleeding."

Dr. Byford now decided that the only way out of the difficulty was to evacuate the uterus. This was done by making an incision about four inches long from near the fundus downwards, so as to include the accidental aperture. The incision exposed the placenta at about the middle of its attachment. This organ was easily and rapidly separated, by passing the index finger between it and the uterine walls, and completely removed. After this was done, the right side of the fœtus, the arm, hip, and feet were perfectly exposed. The breech was seized and drawn towards the opening, when the fœtus was expelled by uterine contraction. The membranes and liquor amnii were next removed, when the uterus was perfectly devoid of all its former contents.

Gestation had advanced to about the middle of the seventh month. The fœtus evinced no signs of life after its removal, and had doubtless died from the effect of hemorrhage from the wounded placenta.

The incision in the uterus was closed by interrupted sutures of fine silk, including the visceral peritoneum, the whole of the muscular wall, and the mucous

membrane. The sutures were cut short, and no provision made for their removal. By the time the sutures were all inserted and tied, the uterus had contracted very firmly.

In order to secure a free exit of the lochia from the cavity of the uterus, and thus prevent the danger of its passing through the wound, the os uteri was freely dilated with the finger, and a long flexible catheter left in some hours. The pedicle of the ovarian cyst was tied with a double ligature of plaited silk, and returned into the abdominal cavity. The ligatures were brought out at the lower angle of the wound, and left long enough to hang down between the thighs. The wound in the abdomen was closed by interrupted sutures, and dressed with a thick layer of carbolized cotton batting. The only interest connected with the future prognosis of the case is, that there was not a disagreeable symptom, except a few trivial after-pains.

Dr. Byford gives abstracts of five cases, which are all he was able to find on record, of the double operation of ovariotomy and hysterotomy, the results of which are confirmatory of the correctness of his practice in this case.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Poisoning of a New-born Child with Nux Vomica.

Cases of infanticide by poisoning are very rare. The following is reported in the *Vierteljahrsschrift für gerichtl. Medicin.*, vol. xxv. Children destroyed within a week of birth generally die from some form of violence which insures rapid death. A girl was secretly delivered of a child on the night of the 16–17th October. She concealed the child, and suckled it for one or two days. On the evening of the 18th October she gave it some camomile tea, into which she had put a teaspoonful of powdered nux vomica. The child had convulsions and died in two hours. The body, which had been thrown into a ditch, was found and submitted to medical examination on the 21st October. It was a mature child and well formed. Although three days had elapsed since death, cadaveric rigidity was very strongly developed in it. Around the navel there was a red circle with a commencement of suppuration. The stomach contained a teaspoonful of a mucilaginous liquid; in the small intestines chymous matter was found, and the large intestines were distended with fecal matter. The viscera of the chest presented the characters of asphyxia. There was no question here of the proofs of live birth. The experts who made the examination came to the conclusion that the child was mature, viable (*i. e.*, had a capacity to live), that it had completely and fully breathed and had died of asphyxia, not before the second day after birth. At this time the mother was unknown, but suspicion fell upon the girl; it was proved that she had been recently delivered, and a box containing nux vomica in powder was found in her possession. A chemical examination of the stomach, intestines, and liver was made, but although that process was employed, not the least trace of strychnia could be detected in the body. There was no doubt, however, that the child had died from strychnia poisoning. The girl confessed the crime

RECLAMATION.

Note on Cholecystotomy.—By W. W. KEEN, M.D., Surgeon to St. Mary's Hospital, Philadelphia.

In a paper in the January number of this Journal, in which I related a case of Cholecystotomy, I referred to Dr. Sims's case as the first that had been done, although the operation had been proposed and discussed much earlier as I stated. I was not aware of one somewhat similar case to which I should have referred, nor of another which, although already published, had not then reached this country. The first case is reported by Prof. Roberts Bartholow and others in the *Cincinnati Clinic* for April 7–21, 1877. In this case Prof. B. aspirated a hydatid cyst of the liver September 10, 1876, and (probably) in December of the same year aspirated the gall bladder removing " six ounces of dark green and very thin bile." So far as I have searched this is the first case in which aspiration of the gall bladder has been done. " No local irritation was produced and careful search after death failed to detect the point of puncture." Moreover, Prof. B. distinctly proposed " the propriety and utility of exploring the cystic and common duct, and had made a small probe twelve inches in length with which to perform this feat. He found that when a small canula is fixed in the gall bladder it is easy to pass a probe of suitable size into the cystic duct. It is probable that such an expedient may be practised in the future with success." To Prof. B. belongs therefore the credit of first formulating such an *aspiration* and *exploration* and of first performing the aspiration itself.

The other case is that of Dr. Geo. Brown (*Brit. Med. Journ.*, Dec. 21, 1878). He aspirated a supposed abscess and drew off f℥vj of non fetid pus. He passed a probe into the abscess cavity and felt some supposed gall stones. January 22, 1878, he made an incision $2\frac{1}{2}$ inches long, opening the peritoneum, could not reach the gall bladder, tore through some adhesions and closed the wound. In the night bile began to be discharged, the tumour disappeared, and she recovered without a fistula. The antiseptic method was not used.

The earlier literature on the subject shows, it is true, that the operation has been both discussed and practised before Sims's operation, but it must be conceded that to him is due the credit of placing it on a new basis as a deliberate operation in the surgery of the abdomen. The earliest reference I have found to the operation is in Petit (*Maladies Chirurg.*, i. 282). Though published in 1790 he states that he read his paper in 1733, and it was already published in the *Mém. de l'Acad. Roy. de Chir.* for 1743, i. 255. He quotes four cases operated on, generally for a supposed abscess, in one of which he himself began the operation but abandoned it. Two of them died, his own case recovered ; the fourth recovered with a fistula through which a calculus was removed at a later period.

He advocates (pp. 312–13) *puncture by a trocar* (the aspirator of course was then unknown), *exploration* by a sound, and removal of a stone if any be found. He then says it is not a new operation, and refers (but does not give his authority) to the two operations done on Mme. Tibergeau. The first was the opening of a supposed abscess which was followed by a fistula, and through this some months later (as in the previous case) the stone was removed. He gives also several cases of removal of calculi through exist-

ing sinuses as has frequently been done. Mr. Bryant has just reported a similar case (*Med. Times and Gaz.*, 1878, ii. 682).

Le Dran (*Traité des Oper. de Chir.*, 1742, p. 253) refers also to the proposals to puncture by a trocar, but opposes it unless adhesions have formed.

Morgagni (*De Sedib. et Causis Morb.* 1761, Bk. iii. Letter xxxvi. Art. 52) says, " It does not escape me, however, that before the swelling occupies all the muscles which lie before the cyst, causes a considerable suppuration on all sides, and the pus forms winding sinuses for itself . . . . the case must of course turn out more successfully with those who open by incision the cyst which has now closely coalesced with the peritoneum" but prefers to wait " till time shall confirm its advantages and remove all doubts, dangers, and difficulties by many repeated experiments." He refers also to the cases of three women of Bologna (Taccon, *De raris quibusd. hepat. affect. observ.*), Francfort (*Act. n. c. tem.* 6 obs. 69), and Göttingen (*Haller, Opusc. Pathol.* Obs. 33, Hist. 8), all of whom had tumours in the epigastrium which were " opened either by art or spontaneously and discharged cystic calculi at the aperture." The first was cured, the second recovered with a fistula, and the third with an ulcer. I cannot verify any of the references.

Good in his *Study of Medicine* (6th Amer. ed. 1835, p. 215), says, that attempts were formerly made to remove such calculi by incision. He quotes a case by Bloch (*Med. Bemerk* No. 5, a reference I cannot verify) in which 62 calculi " were taken away with success, but in general the operation has not answered."

Mr. Harvey (*Lancet*, 1849, i. 182), tapped a case of supposed ovarian cyst. The patient died after doing well for two weeks, and the post-mortem revealed a cyst connected with the left lobe of the liver which was destroyed.

In 1859 Dr. Thudichum (Pathol. and Treat. of Gall Stones, *Brit. Med. Journ.*, Nov. 19, p. 935) suggested " performing an operation for the extraction of these foreign bodies either in a direct manner, or by forming a biliary fistula and adopting a lithotriptic proceeding." He proposed to open the abdomen, seize the gall bladder, fasten it to the abdominal wall, and after adhesions have formed to open it, an operation that has much to commend it. He also noticed two facts of importance : first that the supposed bile contained not a trace of the bile acids as was the fact both in Dr. Sims's case and my own ; second the probability of the nucleus of some of these calculi being casts of the biliary ducts. In the discussion which followed the reading of his paper before the Medical Society of London Mr. Hilton " thought it not impossible that cases fit for operative relief might present themselves and in cases of distended gall bladder (which might occur with calculi) an operation such as the author had mentioned had actually been performed with success." No references are given, and I have not found any such cases except as given above. The suggestions of Mr. Maunder and Dr. Hughlings Jackson I have referred to in the former paper as also to Dr. Sims's case.

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UNIVERSITY OF PENNSYLVANIA.

MEDICAL DEPARTMENT.

Thirty-Sixth Street and Woodland Avenue (Darby Road), Philadelphia.

One Hundred and Fourteenth Annual Session, 1879-80.

PROFESSORS.

CHARLES J. STILLÉ, LL.D., Provost.
GEORGE B. WOOD, M.D., LL.D., Emeritus Professor of Theory and Practice of Medicine.
HENRY H. SMITH, M.D., Emeritus Professor of Surgery.
JOHN NEILL, M.D., Emeritus Professor of Clinical Surgery.

JOSEPH LEIDY, M.D., LL.D., Professor of Anatomy.
RICHARD A. F. PENROSE, M.D., LL.D., Professor of Obstetrics and Diseases of Women and Children.
ALFRED STILLÉ, M.D., LL.D., Professor of Theory and Practice of Medicine, and Clinical Medicine.
D. HAYES AGNEW, M.D., LL.D., John Rhea Barton Professor of Surgery and Clinical Surgery.

HORATIO C. WOOD, M.D., Professor of Materia Medica, General Therapeutics, and Pharmacy, and Clinical Professor of Nervous Diseases.
WILLIAM PEPPER, M.D., Professor of Clinical Medicine.
WILLIAM GOODELL, M.D., Professor of Clinical Gynæcology.
JAMES TYSON, M.D., Professor of General Pathology and Morbid Anatomy.
THEODORE G. WORMLEY, M.D., LL.D., Professor of Chemistry.
JOHN ASHHURST, JR., M.D., Professor of Clinical Surgery.
HARRISON ALLEN, M.D., Professor of Physiology.
WILLIAM F. NORRIS, M.D., Clinical Professor of Diseases of the Eye.
GEORGE STRAWBRIDGE, M.D., Clinical Professor of Diseases of the Ear.
LOUIS A. DUHRING, M.D., Clinical Professor of Diseases of the Skin.

Matriculates are required to attend three winter courses of instruction of five months each, consisting of graded didactic lectures, clinical lectures, and practical work in laboratories and hospitals.

In the graded curriculum adopted, the elementary branches are taught in the *first* course, and students are finally examined at its conclusion upon General Chemistry, Materia Medica and Pharmacy. In the *second* term, while a sufficient repetition of unfinished branches is secured, certain more practical ones are added, and the examinations on Anatomy, Physiology, and Medical Chemistry, at the end of the term are final. In the *third* course is added practical bedside instruction in Medicine, Surgery, and Gynæcology, with clinical facilities in the specialties; and, at its end, students are examined on General Pathology and Morbid Anatomy, Therapeutics, Theory and Practice of Medicine, Surgery, and Obstetrics.

Students who have attended one course in a regular* medical school will be admitted as students of the second course in the University, after having satisfactorily passed an examination in General Chemistry and Materia Medica and Pharmacy. Students who have attended two courses in a regular medical school will be admitted as students of the third course after examination in General and Medical Chemistry, Materia Medica and Pharmacy, Anatomy, and Physiology.

Graduates of other regular medical schools in good standing will be admitted as students of the third course in this institution without any examination.

Graduates of Colleges of Pharmacy and Dental Colleges in good standing are admitted to the *second* course in the University without an examination.

In the Spring session, beginning the first Monday in April, a valuable course on practical and scientific subjects by a large corps of professors and lecturers is given; and the laboratories of Chemistry, Pharmacy, Histology, Physiology, and Pathology are open, affording a valuable postgraduate course.

The Lectures of the Winter Session of 1879-80 *will begin on Wednesday the first day of October, and end on the last day of February.*

The Preliminary Course will begin on Monday, Sept. 8th.

FEES, IN ADVANCE.—1st course of lectures, including matriculation and dissection, $155. 2d course $150, including dissection. 3d course $110, including operating and bandaging. Graduation fee $30.

For Announcement giving full particulars address

JAMES TYSON, M.D., SECRETARY,
P. O. Box 2838, *Philadelphia.*

DENTAL DEPARTMENT.

The Trustees have established a Dental Department, which it is designed to make the most complete school of Dentistry in the world. The professors include those of Anatomy, Physiology, Chemistry, and Materia Medica, in the Medical Department, with CHAS. J. ESSIG, M.D., D.D.S., Prof. of Mechanical Dentistry and Metallurgy, and EDWIN T. DARBY, M.D., D.D.S., Prof. of Operative Dentistry. Two years' study, two courses of lectures, and examination at the end of the first and second courses, are the requirements for graduation. Graduates of the Dental Department of the University may become candidates for the degree of Doctor of Medicine after attending one additional course of lectures; but students in Dentistry who desire to take the Medical Degree also, must notify the Secretary of the Department of Medicine of such intention before the beginning of the second course of lectures, and add to the studies of the Dental Department those of the Medical.

FEES.—Matriculation $5. For one course of lectures $100. Dissecting fee $10. Graduation fee $30.

Sessions commence as those of the Medical Department. For Announcement address CHAS. J. ESSIG, M.D., D.D.S., Secretary, Dental Department, University of Pennsylvania.

* Homœopathic and Eclectic schools are not recognized as being in this category.

BELLEVUE HOSPITAL MEDICAL COLLEGE, CITY OF NEW YORK.

SESSIONS OF 1878-'79.

THE COLLEGIATE YEAR in this Institution embraces a Preliminary Autumnal Term, the regular Winter Session, and a Spring Session.

THE PRELIMINARY AUTUMNAL TERM for 1878–1879 will open on Wednesday, September 18, 1878, and continue until the opening of the Regular Session. During this term, instruction, consisting of didactic lectures on special subjects, and daily clinical lectures, will be given, as heretofore, by the entire Faculty. Students expecting to attend the Regular Session are strongly recommended to attend the Preliminary Term, but attendance during the latter is not required. *During the Preliminary Term clinical and didactic lectures will be given in precisely the same number and order as in the Regular Session.*

The Regular Session will begin on Wednesday, October 2, 1878, and end about the 1st of March, 1879.

FACULTY.

ISAAC E. TAYLOR, M.D., Emeritus Professor of Obstetrics and Diseases of Women, and President of the Faculty.
JAMES R. WOOD, M.D., LL.D., Emeritus Professor of Surgery.
FORDYCE BARKER, M.D., Professor of Clinical Midwifery and Diseases of Women.

AUSTIN FLINT, M.D., Professor of the Principles and Practice of Medicine and Clinical Medicine.
W. H. VAN BUREN, M.D., Professor of Principles and Practice of Surgery, Diseases of Genito-Urinary System, and Clinical Surgery.
LEWIS A. SAYRE, M.D., Professor of Orthopedic Surgery, and Clinical Surgery.
ALEXANDER B. MOTT, M.D., Professor of Clinical and Operative Surgery.
WILLIAM T. LUSK, M.D., Professor of Obstetrics and Diseases of Women and Children, and Clinical Midwifery.
EDMUND R. PEASLEE, M.D., LL.D., Professor of Gynæcology.
WILLIAM M. POLK, M.D., Professor of Materia Medica and Therapeutics, and Clinical Medicine.
AUSTIN FLINT, Jr., M.D., Professor of Physiology and Physiological Anatomy, and Secretary of the Faculty.
JOSEPH D. BRYANT, M.D., Professor of General, Descriptive, and Surgical Anatomy.
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EDWARD G. JANEWAY, M.D., Professor of Pathological Anatomy and Histology, Diseases of the Nervous System, and Clinical Medicine.

PROFESSORS OF SPECIAL DEPARTMENTS, ETC.

HENRY D. NOYES, M.D., Professor of Ophthalmology and Otology.
JOHN P. GRAY, M.D., LL.D., Prof. of Psychological Medicine and Medical Jurisprudence.
ERSKINE MASON, M.D., Clinical Professor of Surgery.
EDWARD L. KEYES, M.D., Professor of Dermatology, and Adjunct to the Chair of Principles of Surgery.
J. LEWIS SMITH, M.D., Clinical Professor of Diseases of Children.
LEROY MILTON YALE, M.D., Lecturer Adjunct upon Orthopedic Surgery.

A distinctive feature of the method of instruction in this College, is the union of clinical and didactic teaching. All the lectures are given within the hospital grounds. During the Regular Winter Session, in addition to four didactic lectures on every week-day, except Saturday, two or three hours are daily allotted to clinical instruction.

The Spring Session consists chiefly of Recitations from Text-books. This term continues from the first of March to the first of June. During this Session, daily recitations in all the departments are held by a corps of examiners appointed by the Faculty. Regular Clinics are also given in the Hospital and in the College building.

Fees for the Regular Session.

Fees for Tickets to all the Lectures during the Preliminary and Regular Term, including Clinical Lectures	$140 00
Matriculation Fee	5 00
Demonstrator's Ticket (including material for dissection)	10 00
Graduation Fee	30 00

Fees for the Spring Session.

Matriculation (Ticket good for the following Winter)	$5 00
Recitations, Clinics, and Lectures	35 00
Dissection (Ticket good for the following Winter)	10 00

Students who have attended two full Winter courses of lectures may be examined at the end of their second course upon Materia Medica, Physiology, Anatomy, and Chemistry, and, if successful, they will be examined at the end of their third course upon Practice of Medicine, Surgery, and Obstetrics only.

For the Annual Circular and Catalogue, giving regulations for graduation and other information, address Prof. AUSTIN FLINT, Jr., Secretary Bellevue Hospital Medical College.

Date Due